September 9, 2015

Dear Sir/Madam:

Attached is Addendum No. 3 for SEPTA's Sealed Bid Number 15-00116-ADMM 40th Street ADA Improvements Project. The bid opening date and time scheduled for Wednesday September 16, 2015 at 2:00 p.m. has remained unchanged. The bids will be opened in Conference Room 11-A of SEPTA'S General Offices, 1234 Market Street, 11th Floor Philadelphia, Pennsylvania 19107.

Any inquiries regarding this bid must be directed to David Morales of the Procurement and Supply Chain Management Department at (215) 580-8104.

Sincerely,

[Signature]

David Morales
Contract Administrator
Procurement & Supply Chain Management Dept.
SEALED BID No. 15-00116-ADMM
40th Street ADA Improvements

ADDENDUM No. 3

To All Bidders:

The following constitutes Addendum No.3 to SEPTA's Sealed Bid No. 15-00116-ADMM 40th Street Improvements. Addendum No. 3 must be acknowledged by inserting the date of the Addendum on Page 20 of the Bid Form. Failure to do so may render a bidder's proposal as non-responsive.

A. General

1. The bid opening date and time scheduled for Wednesday September 9, 2015 at 2:00 p.m. has remained unchanged.
2. Replace (GC) Schedule A – with Revised Addendum #3 (GC) Schedule A, dated September 9, 2015

B. Specifications

1. Delete Specification Section 10800 – Toilet Accessories, and replace with 10800 – Toilet Accessories – Addendum #3,
2. Delete Specification Section 14215 – Heavy Duty Machine Room Less Passenger Elevators, and replace with 14215 – Heavy Duty Machine Room Less Passenger Elevators – Addendum #3
3. Delete Specification Section 16772 – CCTV System, and replace with 16772 – CCTV System- Addendum #3
4. Delete Specification Section 05090 – Metal Fasteners, and replace with 05090 – Metal Fasteners- Addendum #3
5. Delete Specification Section 05520- Handrails and Railings, and replace with 05520- Handrails and Railings-Addendum #3
6. Delete Specification Section 05700- Architectural Metal Screens, and replace with 05700- Architectural Metal Screens – Addendum #3
7. Delete Specification Section 06602 – Flat Plastic Tactile Edge, and replace with 06602 – Flat Plastic Tactile Edge – Addendum #3
9. Delete Specification Section 08130- Stainless Steel Doors and Frames, and replace with 08130- Stainless Steel Doors and Frames- Addendum #3
10. Delete Specification Section 0841- Aluminum Framed Entrances and Storefronts, and replace with 0841- Aluminum Framed Entrances and Storefronts – Addendum #3
11. Delete Specification Section 08710- Door Hardware, and replace with 08710- Door Hardware- Addendum #3
12. Delete Specification Section 08800- Glazing, and replace with 08800- Glazing- Addendum #3
13. Delete Specification Section 09306- Bridgeplates, and replace with 09306- Bridgeplates – Addendum #3
14. Delete Specification Section 09310- Ceramic Tile, and replace with 09310- Ceramic Tile- Addendum #3
15. Delete Specification Section 09670- Seamless Quartz Flooring, and replace with 09670- Seamless Quartz Flooring-Addendum #3
16. Delete Specification Section 10290- Pest Control, and replace with 10290- Pest Control- Addendum #3
Addendum #3  
September 9, 2015

C. Drawings

1. Delete Original Sheet Number: A01, and replace with revised drawing A01-Addendum #3
2. Delete Original Sheet Number: A04, and replace with revised drawing A04-Addendum #3
3. Delete Original Sheet Number:A27, and replace with revised drawing A27-Addendum #3
4. Delete Original Sheet Number A36, and replace with revised drawing A36-Addendum #3
5. Delete Original Sheet Number A37, and replace with revised drawing A37-Addendum #3
6. Delete Original Sheet Number A39, and replace with revised drawing A39-Addendum #3
7. Delete Original Sheet Number A40, and replace with revised drawing A40-Addendum #3
8. Delete Original Sheet Number A43, and replace with revised drawing A43-Addendum #3
9. Delete Original Sheet Number E07, and replace with revised drawing E07-Addendum #3
10. Delete Original Sheet Number E09, and replace with revised drawing E09-Addendum #3
11. Delete Original Sheet Number VT01, and replace with revised drawing VT01-Addendum #3
12. Delete Original Sheet Number VT07, and replace with revised drawing VT07-Addendum #3
13. Delete Original Sheet Number VT08, and replace with revised drawing VT08-Addendum #3
14. Delete Original Sheet Number W1, and replace with revised drawing W1-Addendum #3
15. Delete Original Sheet Number W3, and replace with revised drawing W3-Addendum #3

D. Questions and Answers

1. See attached listings of questions and answers: Response to Pre Bid Questions
Question 1: Sheet DC01 - Which contractor is responsible for removing and re-installing street light on Northwest corner?
Response 1: The general contractor

Question 2: Sheet A01 General Note 28. “ALL MATERIALS AND PRODUCTS IN THIS PROJECT MUST COMPLY WITH THE BUY AMERICA ACT AND MUST BE MADE IN THE USA.” This statement conflicts with Item 22 page 6 of Bid Forms and Agreement PDF “Buy American Provision NOT USED”. Are we required to comply with the Buy America Act?
Response 2: General note 28 on sheet A01 has been omitted.

Question 3: Sheet A27 shows CUSTOM GALVANIZED STL FIXTURE MOUNTING BRACKET, are these provided by the GC?
Response 3: Yes the fixture mounting brackets are to be provided by the GC for installation of the scheduled light fixtures. Please refer to detail 9/A27 as included in Addendum #1 for more information.

Question 4: Sheet A27 shows ½” GALVANIZED STEEL PLATE ENCLOSURE, are these provided by the GC?
Response 4: Yes the galvanized steel plate enclosure is to be provided by the GC.

Question 5: Sheet VT01 Pit Area Note 7.) “MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL LIGHT FIXTURE(S) WITH PROTECTIVE COVER(S).” Should these be provided by the EC or the MC?
Response 5: See attached updated drawing VT01

Question 6: Sheet VT01 Pit Area Note 9.) “GENERAL CONTRACTOR SHALL PROVIDE AND INSTALL AND DEXPLEX GROUND FAULT CIUIT INTERRUPTED (GFCI) CONVENIENCE OUTLET WITHIN PROXIMITY TO THE ELEVATOR PIT LADDER/ACCESS.” Should this be provided by the EC or the GC?
Response 6: See attached updated drawing VT01

Question 7: Sheet VT01 Electrical Note 2 is in conflict with General Note 4, please confirm the GC is responsible for temporary lighting in the work area in accordance with Spec Section 01500.
Response 7: See attached updated drawing VT01

Question 8: Sheet P03 and Sheet FP02 show “HEAT TRACE ELEC CONNECTION”. Please confirm the heat trace is being provided by the MC.
Response 8: Yes heat trace is by the MC and the circuit from the panel to the connection point is by the EC.

Question 9: Sheet P03 and Sheet FP02 show “HEAT TRACE ELEC CONNECTION”. The electrical drawings do not show any circuits for Heat Trace on the plans or in the panel schedules. Please provide circuit information for these loads.
Response 9: See revised drawings E07 and E09.

Question 10: Drawings A36 & A37 describe panels eligible to be included in SEPTA’s art in transit contract. Since the size and quantity of required panels is in question, can an allowance be established to be included in the base bid for this work?

Response 10: A unit cost item has been added to the bid for the panel mesh and bar infill for the panels. This has been clarified on the drawings that are part of Addendum #3.

Question 11: DWG# E10 and Spec. 16772. 2.04 calls for IP switcher and controller. But there are no other details for this equipment. Could you please advise what this equipment for and provide part #.


Question 12: Spec. 16720. 2.01.C. 3. calls for Floor phone stand TR400-1, it is not shown in the drawings. Are these floor stands required in this project? If required how many? Please advise.

Response 12: No customer assistance phones are required.

Question 13: Spec. 16720. 2.01 & 2.02 calls for Analog VOIP gate way 48VDC equipment. But these are NOT shown in the drawings. Are these equipment required in this project? Please advise.

Response 13: No Analog VOIP gateway 48VCD equipment is required.

Question 14: The information for the 5/A36 Screen panel detail does not provide the thickness or type of bar and s-clip for the fabrication of the panel. If there is another detail could you please direct – or could additional information be provided.

Response 14: Please refer to specification section ‘05700 Architectural Metal Screen Panels’ as updated as part of Addendum #1 for details on the makeup of the screen panel construction.
All work in accordance with Sealed Bid and Contract Documents. Contract Documents include SPECIFICATION 40th Street ADA Improvements project and DRAWING SET (137 Drawings).
The General Contractor shall provide all labor, materials, equipment, insurance, bonds, permits, and services necessary to complete work including but not limited to the following items. Bidders must bid individual prices on all items for award consideration.

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION</th>
<th>TOTAL PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DIVISION 1: GENERAL REQUIREMENTS</td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Set up the work area, including, but not limited to, field offices, storage areas, temporary facilities including water, sanitary, telephone, temporary signs, and provide all labor, material and equipment necessary for project supervision, construction and scheduling; furnish, install, maintain and remove all temporary traffic control devices, markings, barricades, fencing and signs for the protection of vehicular and pedestrian traffic on streets and sidewalks within and adjacent to the job site and any other work related to the Division 1 of the specifications.</td>
<td>$</td>
</tr>
</tbody>
</table>

(Print Amount in Words)

| 2        | DIVISION 2: SITWORK | $ |
|          | Provide all labor, material, supervision, and equipment for, but not limited to, demolition, site cleaning, dewatering, excavation support and protection and earthwork, paving and planting/landscaping, and all work related to the relocation of the water main. | $ |

(Print Amount in Words)

| 3        | DIVISION 3: CONCRETE | $ |
|          | Provide all labor, material, supervision, and equipment for, but not limited to, cast in place concrete slabs, footings, fill and miscellaneous cast in place concrete structures, concrete formwork, concrete reinforcement, curing and related work. | $ |

(Print Amount in Words)
<table>
<thead>
<tr>
<th>Division</th>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td><strong>DIVISION 4: MASONRY</strong>&lt;br&gt;Provide all labor, material, supervision, and equipment for, but not limited to, concrete and glazed masonry units and brick and glass blocks installation, including all necessary appurtenances and all other related construction to complete the work.</td>
<td>$</td>
</tr>
<tr>
<td>5</td>
<td><strong>DIVISION 5: METALS</strong>&lt;br&gt;Provide all labor, material, supervision and equipment for, but not necessarily limited to, fabrication, assembly and subsequent erection of structural steel framework, metal decking, metal and ornamental metal fabrications and all related work.</td>
<td>$</td>
</tr>
<tr>
<td>6</td>
<td><strong>DIVISION 6: CARPENTRY</strong>&lt;br&gt;N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>7</td>
<td><strong>DIVISION 7: THERMAL &amp; MOISTURE PROTECTION</strong>&lt;br&gt;Provide all labor, material, supervision and equipment, including, but not necessarily limited to, the application of bituminous damp proofing, insulation, and their framing, built-up hot asphalt roofing, metal flashing &amp; trim, roof hatches and the installation of joint sealers as specified in the contract documents.</td>
<td>$</td>
</tr>
<tr>
<td>8</td>
<td><strong>DIVISION 8: DOORS &amp; WINDOWS</strong>&lt;br&gt;Provide all labor, material, supervision and equipment for, specified doors, windows, access panels, glazed aluminum curtain walls, access panels, and all necessary appurtenances and parts for the completion of the work.</td>
<td>$</td>
</tr>
<tr>
<td>9</td>
<td><strong>DIVISION 9: FINISHES</strong>&lt;br&gt;Provide all labor, material, supervision and equipment for, but not necessarily limited to, wall, ceiling and floor treatments, the installation of field applied painting for all the interior and exterior elements and any other related construction necessary to complete the work.</td>
<td>$</td>
</tr>
<tr>
<td>Division</td>
<td>Description</td>
<td>Amount</td>
</tr>
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</tr>
<tr>
<td>10</td>
<td>DIVISION 10: SPECIALTIES</td>
<td>Provide all labor, material, supervision and equipment for, but not necessarily limited to the installation of toilet compartments, signage and other identifying devices, bulletin boards, metal lockers, fire extinguisher cabinets, metal storage shelving, toilet accessories, and other related work.</td>
</tr>
<tr>
<td>12</td>
<td>DIVISION 12: Furnishings</td>
<td>Provide all labor, material, supervision and equipment for, but not necessarily limited to, the installation of roller shades, manufactured, entrance mats and frames and all related work.</td>
</tr>
<tr>
<td>14</td>
<td>DIVISION 14: Conveying Systems (Elevators)</td>
<td>Provide all labor, material, supervision and equipment for, but not necessarily limited to, the installation of two Heavy Duty Machine Room Less Elevators and all related work.</td>
</tr>
</tbody>
</table>

PART A SUM (SUM OF ALL ITEMS #1 THRU #14): $
(GC)

INCORPORATING SPECIAL CONDITION – UNIT PRICES
REVISED – ADDENDUM #3
SCHEDULE OF ITEMS

Part A: $

Part B: Unit Prices:

In accordance with paragraph XIV.D.1 of the Agreement, changes in the Work, the unit prices below are established for determining the amount of increase or decrease of the Contract Sum resulting from adjustments for actual quantities of the following items of work or material. All items Nos. 1 inclusive must be bid for award consideration. The unit prices below are to be fully burdened and include labor, material, equipment, overhead, profit, bonds and insurance. If the actual quantity of unit pricing for that items varies more than fifteen percent (15%) above or below the estimate quantity, unit pricing for that item may be adjusted at SEPTA’s option. All unused price quantities shall be credited back to SEPTA at the end of the project. The estimated quantities shown in the unit prices schedule are not in the base contract. This pricing is for work which is in addition to the contract documents.

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Unsuitable Material- Unsuitable materials as defined by specification 02220, encountered in any of the excavations for Elevators 1 or 2.</td>
<td>40</td>
<td>CY</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>2</td>
<td>Panel Mesh – Stainless Steel, Top and Bottom panels, for stair headhouse walls. Defined by specification 05700</td>
<td>601</td>
<td>SF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bar Infill Panels – Stainless Steel, Middle panels, for stair headhouse walls. Defined by specification 05700.</td>
<td>259</td>
<td>SF</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Part B (Sum of Items #1 thru #3) $

Total Contract Sum (Sum of Parts A & B) $

From:
Name of Bidder

Address of Bidder

City, State, Zip

Telephone Number FAX Number (if available)

E-Mail Address (if available)

BASIS OF AWARD: Please refer to Instructions to Bidders Item #4. (GC)
SECTION 05090
METAL FASTENINGS

PART 1 GENERAL

1.01 DESCRIPTION
A. The work of this section consists of the fabrication and delivery of fasteners, anchoring systems and related accessories as shown on the contract drawings and specified herein.

1.02 REFERENCES
A. American Society for Testing and Materials (ASTM):
B. Federal Specifications, FF-S-325 - Shield, expansion; Nail, Expansion; and Nail, Drive Screw (Devices, Anchoring, Masonry) Group II (Shield, Expansion Bolt Anchor) Type 4 (Wedge Expansion Anchors) Class 1 (One Piece Steel Expander with Cone Taper Integral with Stud).

1.03 SUBMITTALS
A. Provide six (6) copies of manufacturer's catalog cuts and product literature for all products including but not limited to grout, rivets, nuts, bolts, expansion bolts, screws, threaded rods, washers, and adhesive anchoring systems.

1.04 QUALITY ASSURANCE
A. Fabricator's Qualifications: All fabricators shall have experience in the successful completion of projects employing similar materials, applications, and performance requirements.
B. Manufacturer's Qualifications: All manufacturers shall have experience in the successful completion of projects employing similar materials, applications, and performance requirements.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Deliver materials in Manufacture’s original unopened package, with brand names and material designations marked thereon.

1.06 WARRANTIES

A. The Contractor shall provide manufacturers’ standard warranties for all products.

PART 2 PRODUCTS

2.01 MATERIALS

A. Drilled-in concrete anchors: Hilti HIT RE-500 injection adhesive epoxy system with stainless steel threaded rods, locking nuts and washers, or approved equal.

B. Blind rivets shall be stainless steel with domed head. Rivets shall be installed with domed head on the side with predominant view. Refer to drawings for rivet diameters.

C. Grout

1. Nonshrink, nonmetallic grout, factory packaged nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for exterior and interior applications.

2. Five Star Grout manufactured by Five Star Products or approved equal.

D. Adhesive Anchors: Composed of an anchor rod assembly and an anchor rod adhesive cartridge.

1. Anchor Rod Assembly: Chamfered and threaded stud rod of ASTM A325 steel with nut and washer. Stud size as indicated on Drawings.

2. Adhesive cartridge: Sealed capsule containing premeasured amounts of resin, quartz sand aggregate, and a hardener contained in a separate vial within the capsule. Capsule ingredients activated by the insertion procedure of the anchor rod assembly.

3. Acceptable Manufacturers:
   b. Molly Fastener Group.
c. Or approved equal.

PART 3 EXECUTION

3.01

A. Refer to Section 01010 Summary of Work.

END OF SECTION
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SECTION 05520
HANDRAILS AND RAILINGS

PART 1  GENERAL

1.01 DESCRIPTION
   A. Provide all labor and materials to shop fabricate stainless steel assemblies as shown on the drawings and described herein.
      1. Handrails
      2. Railings
      3. Cane Detection Rails

1.02 RELATED SECTIONS
   A. Section 01400 – Quality Requirements
   B. Section 03600 – Grout
   C. Section 05120 – Structural Steel
   D. Section 05500 – Metal Fabrications
   E. Section 09310 – Ceramic Tile
   F. Section 09330 – Quarry Tile

1.03 REFERENCES
   A. ASTM - American Society for Testing and Materials
      1. ASTM A312/312M - Seamless and Welded Austenitic Stainless Steel Pipes
      2. ASTM A480/480M - General Requirements for Flat-Rolled Stainless and Heat Resisting Steel Plate, Sheet, and Strip
      3. ASTM A484/484M - General Requirements of Stainless Steel Bars
      4. ASTM A555/555M - General Requirements for Stainless Steel and Heat Resistant Steel Wire and Wire Rods
      5. ASTM A666 - Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar for Structural and Architectural Applications
      6. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws and Studs
   B. AWS - American Welding Society
      1. AWS D1.6 Structural Welding code – Stainless Steel
C. NAAMM – National Association of Architectural Metal Manufacturers
   1. Metal Finishes Manual; Code of Standard Practice for the Architectural Metal Industry

1.04 SUBMITTALS

A. The Contractor shall provide (3) copies of the following:
   1. Scaled shop drawings of each fabrication. Include plans, sections and details of connections.
   2. Shop drawings shall include materials schedule, hardware installation details, weld sizes & symbols, finishes, notes and dimensions of all components.
   3. Welding procedure qualifications.
   5. Manufacturer’s technical data (cut-sheets)
   6. Mill Certifications.
   7. Passivation Certification.
B. The Contractor shall provide one (1) each of the following for each fabrication shown:
   1. 12” square and / or lineal sample which will show adequately the quality of fabrication, welding and finish. These can also represent the required finish samples as noted elsewhere in the specification.

1.05 QUALITY ASSURANCE

A. Certify that each welder has satisfactorily passed AWS qualification testing for welding processes involved and possesses current certification.
B. Comply with applicable provisions of AWS Structural Welding Code.
C. Stainless steel fabrications shall be from a manufacturer who has a dedicated facility for the assembly, welding, and polishing of stainless steel. The manufacturer should have dedicated tooling, fixtures, and machine tools, for the manufacturer of stainless steel products. Dedicated is defined as exclusively used for the use on stainless steel materials. This is to avoid contamination with other metals, especially carbon steel.
D. SEPTA reserves the right to shop inspect at any time during the fabrication and finishing processes.
E. The contractor must notify SEPTA (5) days prior to beginning fabrication and finishing, to determine if SEPTA shall require a shop inspection prior to allowing the product to move forward to the next phase.
F. Provide certification by the passivator stating that the fabrication was passivated after the stainless steel was bent, cut and/or welded.
G. Design Requirements for Hand and Guardrails:

1. Railing assembly, wall rails, and attachments shall resist a concentrated load of 200 lbs applied at any point in any direction and a uniform load of 50 lbs per linear foot applied in any direction.

2. Guardrail assembly and attachments shall resist a concentrated load of 200 lbs applied at any point in any direction along the top railing member. Guardrail assembly shall also be designed to resist a uniform load of 50 lbs per square foot applied horizontally at the required guardrail height and a simultaneous uniform load of 100 lbs per square foot applied vertically downward at the top of the guardrail. The concentrated and uniform load shall not be applied simultaneously.

3. Where guard and handrails shall be installed in close proximity to overhead or third rail electrical services the assemblies shall be properly grounded and bonded by the electrical contractor. Note however, that the fabricator shall only be responsible for providing tabs, (2) per guard / handrail assembly, located at both ends of the bottom horizontal tube for the attachment of grounding cables. The responsibility for the installation of the hand and guardrails per the Electrical Drawings so that grounding and bonding will function as intended shall be the responsibility of the Contractor.

H. Field Visit and Measurements:

4. Prior to beginning the fabrication of the hand and guardrails for stairs and ramps, detailed field measurements must be taken.

5. When steel fabrication will be installed into an existing structure, or where the guard and handrail are configured different from the standard platform module layouts; "A," "B," "C," and "D," as shown on the standard guard/handrail drawings then field measurements for shop drawings shall be required prior to beginning fabrication.

6. Any discrepancies between the drawings and what is in the field shall be brought to the attention of the project manager. It is assumed that slight variation may exist and this is to be expected. Extras associated with discrepancies shall only be granted where these discrepancies can be proved to be a major consequence on the design and fabrication.
7. It is recommended that the fabricator visit the site prior to bidding on any fabrication in which the size of the project may require special on-site handling requirements, or where the fabrication must fit into existing conditions.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package so that products will not be damaged during shipping or storage.

B. Clearly label each package of contents. Label shall be on (2) ends and (1) face. Contents shall be labeled and coordinated with installation drawings.

C. Ship items to SEPTA location as described in purchase requisition.

1.07 WARRANTY

A. All components shall be warranted for 1 year against frame failure, mill scale, rusting, corrosion, rust stains, chipping, and/or discoloration.

PART 2 PRODUCTS

2.01 MATERIALS

A. Stainless Steel shall be Austenitic Grade type 316/316L

B. Stainless Steel Sheet, Plate, Flat Bar: ASTM A666, Type 316/316L


2.02 FABRICATION

A. Form fabrications from material of size, thickness and shapes indicated, but not less than that needed to comply with the performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of material indicated or specified for various components of each metal fabrication.

B. Shear, punch, and laser cut metals cleanly and accurately. Remove burrs, sharp and rough areas on exposed surfaces.

C. Weld corners and seams continuously to comply with the following:
   1. Use materials and methods that minimize distortion and resist corrosion of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
D. Form exposed connections with hairline joints, flush and smooth using concealed fasteners wherever possible. Miter all corners.

E. Fabricate components with joints tightly fitted and secured.

F. Grind exposed joints and welds flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush and hairline.

G. Form exposed edges to small uniform radius.

H. Exposed sheet edges shall be hemmed.

I. Cut, reinforce, drill and tap metal fabrications to receive finish hardware, screws and similar items.

J. Exposed surfaces of all products shall be clean and free from surface blemishes, scratches or tool marks.

K. Fabricator shall take all preventative measures to eliminate cross-contamination of stainless steel with ferrous metals during fabrication, machining, storage and delivery. All grinding, polishing, and buffing shall be performed so that no contamination occurs to affect the material's corrosion resistance or finish. Particular care shall be exercised to protect the material from coming in contact with iron particles. All tools used in the fabrication and finishing process shall be tools dedicated only to use on those materials.

L. All mill seams and marks shall be concealed or located out of prevalent field of vision.

M. All welds shall be fully restrained. Close off all open tube ends with stainless steel plates, except the bottoms of vertical members that shall receive vent holes.

N. Hermetically seal all joints so as to exclude water, or provide weep holes where water may accumulate.

O. All stainless steel shall be passivated prior to packaging and shipping. Any area that has been cut, welded or bent shall be passivated to assure that the area does not show signs of rust discoloration created by the fabrication processes.

P. Fabrication Tolerances:
1. Maximum bow - 1/4 inch per 4 feet
2. Maximum out of plane - 1/16 inch
3. Maximum misalignment - 1/8 inch

Q. Finish
1. Stainless Steel grain shall run in same direction for each fabrication.
2. Finish shall be #4 brushed for all components unless otherwise specified on the drawings.
3. When polishing is completed, passivate and rinse surfaces. Remove any embedded foreign matter and leave surfaces chemically clean.

PART 3 EXECUTION

3.01 EXAMINATION AND INSPECTION
A. SEPTA reserves the right to shop inspect at any time during the fabrication and finishing process.

B. The contractor must notify SEPTA (5) days prior to beginning fabrication to determine if SEPTA shall require a shop inspection prior to allowing the product to move forward to the next phase.

3.02 INSTALLATION

A. All work shall be installed by the contractor’s forces.

B. The contractor shall supply all fasteners and attachments, which shall be, but not necessarily limited to, stainless steel threaded rods, washers, bolts, and nuts. Exposed fastener heads shall be painted to match the surrounding materials/assembly. Exposed fasteners shall be vandal resistant.

C. Set work accurately, in alignment and where shown, plumb, level, free of rack and twist, and set parallel or perpendicular as required to line and plane of surface.

D. Items set into existing concrete or masonry.
   1. Provide temporary bracing for such items until fencing is set and rigid.
   2. Place in accordance with setting drawings and instructions.

E. Set frames of covers, and similar items flush with finish floor or wall surface and, where applicable, flush with side of opening.

F. Replace any tile damaged by the installation of new Work detailed in this Section. Refer to Section 09310 – Ceramic Tile and Section 09330 – Quarry Tile.

G. Field weld in accordance with AWS.
   1. Design and finish as specified for shop welding.
   2. Use continuous weld unless specified otherwise.

H. Install anchoring devices and fasteners as shown and as necessary for securing metal fabrications to building construction as specified. Expansion Anchors should be used where shown on the drawings and elsewhere except where shown otherwise. Power actuated drive pins may be used except for removable items and where members would be deformed or substrate damaged by their use.

I. Isolate components from dissimilar metals and from contact with concrete and masonry materials as required to prevent electrolysis and corrosion.
3.03 INSTALLATION OF SUPPORTS

A. Anchorage to structure.
   1. Secure framing and connections to structure as shown or as required.
   2. Secure steel plate and steel angles to slabs or ceiling, with expansion anchors unless shown or specified otherwise.

3.04 CLEANING AND ADJUSTING

A. Clean after installation exposed pre-finished and plated items and items fabricated from stainless steel, as recommended by the metal manufacture and protect from damage until completion of the project.

END OF SECTION
SECTION 05700
ARCHITECTURAL METAL SCREEN PANELS

PART 1 GENERAL

1.01 DESCRIPTION

A. This Section specifies the furnishing and installation of the prefabricated custom
designed stainless steel architectural screens.

B. Related Section

1. Section 05500 - Metal Fabrications
2. Section 07900 - Joint Sealants and Caulking
3. Section 05100 - Structural steel

1.02 REFERENCES

A. ASTM A-666 Stainless Steel Strip

B. ASTM A-269 Stainless Steel Tubing

C. ASTM A-967 Standard for Chemical Passivation for Stainless Steel

D. ANSI/NAAMM- MBG-531-09 Metal Bar Grating Manual

1.03 SUBMITTALS

A. Product Data: Manufacturer's current product specifications and installation
   instructions.

B. Sample of screen, not less than 12” in length and width, illustrating the specified
   pattern, finish and construction.

C. Shop Drawings: Include plans, elevations, and details of sections and connections.
   Show type and location of all fasteners
1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: A company designing, manufacturing, and installing products of this section which have performed in a satisfactory manner under comparable conditions.

B. All screens are to be factory formed and packaged per job requirements

1.05 WARRANTY

A. Provide manufacturers standard warranty.

1.06 DELIVERY, STORAGE, AND HANDLING

1. Deliver materials in protective wrappings with each item labeled with installation location.

B. Store all items inside in dry location.

1.07 CERTIFICATION

A. Manufacturer will provide a "Certificate of Compliance" upon completion of installation attesting that all components and installation conforms to the requirements on drawings and in specifications.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hendrick Architectural Products (Basis of Design)

B. C.R. Laurence Co., Inc.

C. Or Engineer’s approved equal

2.02 FABRICATION

A. Fabricate screens using Profile Bar wires and U-clip supports from 316L stainless material. Sections to be supplied in lengths as needed with opening area as required and 0 degree deflection.
1. Profile Bars: B6 profile bar by Hendrick Architectural Products

2. U-clip Supports: 15/16” U-clip supports by Hendrick Architectural Products

B. Design Criteria:

1. **Loading**: Grating Products shall be designed and manufactured to meet the live load conditions of 300 lbs/ Sq Ft with maximum deflection of 1/8” for the clear spans shown on the drawings. Bearing bar depth shall be as shown on the contract drawings or as recommended by the manufacturer to meet the loading requirements, clear span conditions and maximum deflections specified.

C. **Materials**: Bearing bars and banding are per ASTM A-666 Stainless Steel Strip – 316L and Stainless Steel Tube Cross Bars are type ASTM A-269 Stainless Steel Tubing Alloy 316L.

D. **Fabrication Tolerances** shall be in accordance with ANSI/NAAMM MBG 531-09 Metal Bar Grating Manual.

E. **Finish**: Gratings shall be a matte non-directional finish unless otherwise specified.

2.03 Accessories:

A. Provide appropriate fasteners for type, grade, and class required for the approved anchorage system.

PART 3 EXECUTION

3.01 PREPARATION

A. Field Measurements

   I. Field measurements should be taken by the installer for verification of dimensional correctness in relationship to original plans, prior to providing manufacturer with a bill of material.

B. Delivery, Storage and Handling

   I. Do not deliver materials of this section to project site until suitable facilities for storage and protection are available.
2. Protect materials from damage during transit and at project site. Store under cover, but sloped to provide positive drainage. Do not expose materials with strippable protective film to direct sunlight or extreme heat.

3. Do not allow storage of other materials or allow staging of other work on installed metal panel system.

4. Upon receipt of delivery of metal panel system, and prior to signing the delivery ticket, the installer is to examine each shipment or damage and for completion of the consignment.

C. Sequencing and Scheduling

1. Installer shall coordinate with general contractor as to scheduled delivery time after receipt of field verified bill of materials by manufacturer as it relates to actual project scheduling.

3.02 ARCHITECTURAL METAL SCREEN INSTALLATION, GENERAL

A. Prior to screen installation, contractor shall inspect supports for correct alignment and conditions for proper attachment and support of the screens. Any inconsistencies between contract drawings and supporting structure deemed detrimental to grating placement shall be reported in writing to the architect or owner’s agent prior to placement.

B. Install screens in accordance with shop drawings and standard installation clearances as recommended by ANSI/NAAMM MBG-531-09 Metal Bar Grating Manual. Use approved attachment system and fasteners to secure grating to supporting members as shown on plans.

3.04 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as architectural metal screens are installed. Maintain in a clean condition during construction.

B. Protection: Provide as required completed work of this section will be without damage or deterioration at date of substantial completion.

C. Upon completion of installation, remove scraps and debris from project site.

3.05 REPLACEMENT INSTRUCTION
A. Furnish SEPTA with a copy of the panel manufacturer’s complete printed instructions for the replacement of damaged panels.

END OF SECTION
SECTION 06602

FLAT PLASTIC TACTILE EDGE

PART 1 - GENERAL

1.01 DESCRIPTION

A. All work related to the demolition, procurement and installation of the tactile warning tiles is by SEPTA. The contractor is responsible for coordinating with SEPTA for access and phasing of this work.

B. This section specifies the manufacture and delivery of Plastic Detectable Warning Tile that meets both the latest editions of the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and ANSI A117.1 codes.

C. The supplier shall provide all materials required for a complete installation by SEPTA, this shall include but not necessarily be limited to Plastic Detectable Warning Tile, Adhesive, and Stainless Steel Fasteners including Plastic Fastener Caps.

D. The supplier shall be responsible for packaging, labeling and shipping the complete order, at one time, to a SEPTA location as described in the boiler plate.

1.02 SUBMITTALS

A. Product Data: Submit manufacturer's literature describing products, installation, procedures, and routine maintenance.

B. Samples: Submit full size samples of detectable warning surface tile, of the kind proposed for use.

C. Material Test Reports: Submit test reports from qualified independent testing laboratory indicating that materials proposed for use are in compliance with all specification requirements and that both the coefficient of slip resistance and dome layout meets and or exceeds those recommended by both the latest editions of ADAAG and ANSI codes.

D. Shop Drawings: Submit standard Shop Drawings indicating installation method and layout.

1.03 QUALITY ASSURANCE & CODE COMPLIANCE

A. Manufacturer: Provide adhesives and fasteners that are compatible and approved to be used with the Flat Plastic Detectable Warning Tile.
B. Warranty: The manufacturer shall warranty the material and the system for a period of ten (10) years from the date of substantial completion. This warranty shall cover the material and the system from failure including color fade, hazing, cracking, and fiber bloom.

C. Truncated dome size, profile, spacing, and layout shall match those specified in both the latest editions of ADAAG and ANSI A117.1 (Alignment: Truncated domes shall be aligned in a Square Grid Pattern).

D. Fasteners shall be 304 Stainless Steel and shall be tested to assure compliance. Vendor shall provide clear documentation confirming the grade of the stainless steel fasteners.

E. Fire Performance Testing and Approvals:

1. "Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Covering, and Miscellaneous Materials". Flame spread and smoke developed of tile adhered to 1/4" fiberglass reinforced cement board not to exceed 15 flame spread and 275 smoke developed when tested per ASTM E84.

2. "Specific Optical Density of Smoke Generated by Solid Materials". The smoke density of tile adhered to 1/4" fiberglass reinforced cement board not to exceed specified values in compliance with the U.S. Department of Transportation Urban Mass Transportation Guidelines. These are less than 100 DS 1.5 and Less than 200 DS 4.0 when tested per ASTM D662.

3. "Toxic Gas Generation". Toxic gas generation of tile adhered to 1.4" fiberglass reinforced cement board not to exceed the following Specified values in compliance with the U.S. Department of Transportation Urban Mass Transportation Guidelines: Boeing BSS 7239 - Requirements: Products of combustion are to be less than the Specified maximum for CO, HCN, HCl, HF, HBr, SO, NO

4. "Critical Radiant Flux of Floor Covering System Using a Radiant Heat Energy Source". Critical radiant flux of tile adhered to 1/4" fiberglass reinforced cement board not to be less than the following Specified value: ASTM E648 - Requirement: >1.10 w/cm.²

5. Detectable warning surface tile shall meet or exceed the following test criteria:

a. Dimensions of tile to be held within the following dimensions and tolerance:
Length & Width: 48.000" x 24.000" +/-0.6% max.
Thickness: 0.375" +/-5% max.
Edge Warp: +/-0.5% max.
b. Water Absorption, ASTM D 570: 0.07% max.
c. Slip Resistance, ASTM C 1028: 0.80 min.
d. Compressive strength, ASTM D 695: 28,000 psi min.
e. Tensile Strength, ASTM D 638: 11,000 psi min.
f. Flexural Strength, ASTM D 790: 25,000 psi min.
g. Salt and Spray Performance, ASTM B 117: No deterioration after 200 hours of exposure.
h. Abrasion Resistance, ASTM C 501: 300 min.
i. Chemical Stain Resistance of tile when tested by ASTM D2299 shall exhibit no discoloration or staining to bleach solution, turpentine, iron oxide, ethane, soap solution, hydraulic oil, motor oil, carbon black, calcium chloride, and ethylene glycol.
j. Fire Resistance of Tile when tested to ASTM E 84-05 flame spread be less than 15.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Detectable warning surface tiles shall be suitably packaged or crated to prevent damage in shipment or handling. Finished surfaces shall be protected, and each tile type shall be identified by a cast-in-part number. Special care shall be taken to protect all corners.

B. Tiles shall be delivered to location for secure storage prior to installation.

1.05 JOB CONDITIONS

A. Environmental conditions and protection: Maintain the ambient temperature at 40° F or above during installation and curing.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Vitrified Polymer Composite (VPC) Surface Applied Detectable/Tactile Warning as manufactured by:

- Armor-Tile, 300 International Drive, Suite 100, Williamsville, NY 14221 (800-682-2525),
ADA Solutions, INC, P.O. Box 3, North Billerica, MA 01862 (800-372-0519)
or approved equal.

1. Size: VPC tiles shall be nominally 48" x 24" with a thickness not less than 3/8" or greater than 1/2". Color shall be "Safety Yellow" conforming to Federal Color No. 33538. Color shall be homogeneous throughout the tile.

2. Dome Spacing:
   - Size – Truncated domes shall have a base diameter of 0.9 inch minimum to 1.4 inch maximum to 65 percent maximum of the base diameter.
   - Height – Truncated domes shall have a height of 0.2 inch.
   - Spacing – Truncated domes shall have a center to center spacing of 1.6 inches minimum and 2.4 inches maximum, and a base-to-base spacing of 0.65 inch minimum, measured between the most adjacent domes on the grid.
   - Alignment – Truncated domes shall be aligned in a square grid pattern.

3. Profile: Detectable Warning Tile shall be flat and without flanges or sloped beveled edges (45 degree slope at edge is acceptable as long as slope distance is not greater than ¼”). Kerf cuts shall not be required. When panel is laid flat warping shall not be evident.

B. Setting, Grouting, and Mechanical Fastener Materials:

1. Heavy duty white elastomeric polyurethane adhesive "ULTRA SET" as manufactured by Mapei, Bostik, or ADA ChemLink M1 Adhesive or approved equal.

2. Joint Sealant shall be BASF NP1 or Sikaflex 1A or approved equal.

3. Stainless Steel Pin Bang Rivets, 1/4-inch x 1 1/2-inches, to be positioned in the molded recess of a minimum fifteen (15) truncated domes per tile positioned at both the perimeter and interior of each tile.
   - Type: 304 Stainless steel.

4. Vitrified Polymer Composite (VPC) truncated dome caps to be press fit and bonded into fifteen (15) corresponding truncated domes.
PART 3 - EXECUTION

3.01 SHIPPING AND HANDLING

A. General

1. All products shall be bundled and pallet packed for shipping.

2. Each pallet shall be individual wrapped in plastic.

3. Adhesives and Stainless Steel fasteners shall be individually boxed. Label all boxes on a minimum three sides of its contents. Protect each box from damage.

4. The supplier shall be responsible for providing all materials (adhesives, caulks, stainless steel fasteners) in adequate quantities for a proper installation.

B. Shipping Location

1. Ship all components to a SEPTA location as identified in the boiler plate of the purchase document. Coordinate the shipping date and time with the assigned Project Construction Manager as identified on the Purchase Order.

END OF SECTION
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SECTION 07811
FIRE-RESISTIVE MATERIALS

PART 1 GENERAL

1.01 WORK INCLUDED
   A. Provide materials, labor, and equipment necessary to install fireproofing as shown on the drawings and as specified herein, in accordance with contract documents.

1.02 RELATED WORK
   A. Section 05120 - Structural Steel
   B. Section 07270 - Firestopping

1.03 QUALITY ASSURANCE
   A. Application of fireproofing shall be performed by a qualified applicator acceptable to the Manufacturer.
   B. A Certified Installation Certificate must be completed and submitted at end of project.
   C. Provide materials and construction for hourly ratings listed in the Underwriters Laboratories, Inc. Fire Resistance Directory or as calculated by the American Iron and Steel Institute formula.
   D. Field constructed mock-up: Apply sample section to representative substrates on site. Mock-up should include primer, fireproofing at required thickness, density, and finished surface, and all finish coatings.

1.04 REFERENCES
   A. American Society for Testing and Materials (ASTM)
      1. E84 Surface Burning Characteristics
      2. E119 Fire Tests of Building Construction
      3. E605 Thickness and Density
      4. E736 Cohesion / Adhesion
      5. E759 Deflection
      6. E760 Impact on Bonding
      7. E767 Compressive Strength
      8. D790 Flexural Properties
      9. E859 Air Erosion
     10. E937 Corrosion of Steel
   C. American Iron and Steel Institute, Designing Fire Protection for Steel Columns.
   D. Factory Mutual System Approval Guide.

1.05 SUBMITTALS
   A. Product Data: Submit manufacturer's current Product Data and Application Instructions.
B. Fireproofing manufacturer's certification that the materials to be supplied comply with the specifications and are suitable for the use intended.
C. Fireproofing manufacturer's certification that the minimum performance standards as required under Section 2.01-A can be met and test reports supplied as requested.
D. Schedule of Underwriters Laboratories, Inc. designs or American Iron and Steel Institute calculations to achieve the required hourly ratings.
E. At completion of project, Certified Installation Certificate.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Material shall be delivered in original unopened packages, identified as to manufacturer and type, bearing the proper Underwriters Laboratories, Inc. label for fire resistance construction.
B. Material shall be stored above ground, kept dry until ready for use. Materials shall be used prior to expiration date.

1.07 SITE CONDITIONS
A. Minimum application temperature for air and substrate must be 40°F. If required for project progress, General Contractor shall provide enclosures with heat to maintain temperatures.
B. General Contractor shall provide ventilation for proper drying of the fireproofing during and after its application. In poorly ventilated areas, forced air shall be used to achieve a total air exchange of four times per hour until the material is substantially dry.
C. After application, fireproofing must be protected from running water or rain for 24 hours at 70°F or longer at lower temperatures.

1.08 SEQUENCING
A. Coordinate application of fireproofing with related work specified in other sections to comply with the following requirements:
   1. Prevent deterioration due to exposure to unfavorable environmental conditions.
   2. Protect fireproofing from abrasion and other damage likely to occur during construction operations after its application.
   3. Install fireproofing prior to installation of enclosing or concealing work, allowing sufficient time for inspection, testing, and correction of defective fireproofing.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Pyrocrete 241 by Carboline Company
B. Or engineer’s approved equal.

2.01 MATERIALS
A. Cementitious fireproofing shall provide compliance with all drawings, specifications, and the following performance criteria:

1. Dry Density: The in place density shall be measured in accordance with ASTM E605. Average and individual density shall be 55/50 pcf respectively.

2. Bond Strength: When tested in accordance with ASTM E736 over steel, fireproofing shall have a minimum bond strength of 3563 psf.

3. Compressive Strength: Fireproofing shall achieve an average value of 615 psi when tested in accordance with ASTM E761.

4. Deflection Resistance: Material shall not crack or delaminate from the surface when tested by ASTM E759.

5. Corrosion: Material shall show 0.00 gm/mm\(^2\) of corrosion when tested by ASTM E937.

6. Impact Resistance: Material shall not crack or delaminate from the surface when tested by ASTM E760.

7. Hardness: When tested for Shore D hardness by ASTM D2240, the results shall average a minimum of 55.

8. Surface Burning Characteristics: Maximum flame spread and smoke development shall be 0 and 0 when tested under ASTM E-84.

9. Average flexural strength shall be a minimum 502 psi and maximum strain shall be 0.0015 in./in. when tested by ASTM D790.

B. Fireproofing shall have been tested by Underwriters Laboratories, Inc. in accordance with the procedures of ASTM E119 and ASTM E1539.

C. Fireproofing shall be investigated for exterior use by Underwriters Laboratories, Inc.

D. Fireproofing shall be free of asbestos, mineral fibers, polystyrene, or other known materials which may be considered hazardous either during mixing, application curing, or chemical release in a fire.

E. Mix water shall be potable and free from such amounts of mineral or organic substances that would effect application or set of material.

2.03 ACCESSORIES

A. Metal Lath: Shall be 2.5 or 3.4 lbs./sq. yd according to the appropriate Underwriters Laboratories, Inc. design and/or manufacturer application criteria.

B. Reinforcing Mesh: Shall be No. 19 SWG galvanized steel wire as described in appropriate Underwriters Laboratories, Inc. design.

D. Plastic Nose Cornerbead: Optional; supplied by fire proofing manufacturer

E. Caulk: Caulking shall be provided according to the appropriate Underwriters Laboratories, Inc. design

PART 3 EXECUTION

3.01 EXAMINATION

A. All surfaces to be fireproofed shall be cleaned to the satisfaction of the applicator. Surface preparation shall be the responsibility of the steel fabricator, General Contractor, or trade effecting improper adhesion.
B. Primed steel must follow the current Underwriters Laboratories, Inc. application requirements for bond and/or mechanical attachment.
C. Unprimed steel must follow the application requirements of the manufacturer.
D. Verify that objects which will penetrate fireproofing such as clips, hangers, support sleeves, etc. are securely attached to the substrate.
E. Verify that substrates are not obstructed by ducts, piping, equipment, or other construction which might interfere with fireproofing application. If obstruction(s) are evident, General Contractor to have responsible trade remove obstruction until fireproofing is completed in the area.
F. Do not proceed with fireproofing application until all unsatisfactory conditions have been corrected.

3.02 PREPARATION
A. Clean substrates, removing dirt, dust, oil, grease, loose material, incompatible primers, or other substances which may impair bonding of fireproofing to the substrate.
B. Where required, install metal lath and/or reinforcing mesh per the Underwriters Laboratories, Inc. and the manufacturer’s design and application requirements.
C. Corner beads, when used, shall be mechanically fastened to the metal lath.
D. Provide drop cloths, masking, or other satisfactory protection for surfaces not to receive fireproofing to prevent damage from overspray.

3.03 APPLICATION
A. Comply with manufacturers current instructions for equipment and application procedures.
B. Apply fireproofing in thickness and density required to achieve fire resistance ratings.
C. Finish surface shall be smooth trowelled.
D. Caulk shall be installed at fireproofing terminations.

3.04 FIELD QUALITY CONTROL
A. SEPTA may select an independent testing laboratory to sample and verify the thickness and density of the fireproofing in accordance with provisions of ASTM E605. Fireproofing for density may be trowelled in separate, designated containers to minimize patching at site.
B. Results of these tests shall be made available to all concerned at the completion of each area.

3.05 PROTECTION
A. Coordinate installation of fireproofing with other trades in order to minimize the need to cut or remove fireproofing. As other trades successfully complete installation of their work, maintain protection of fireproofed portions of the structure by repairing any areas which have been removed or damaged prior to concealment of fireproofing by other work.
3.06 PATCHING AND REPAIR
   A. Fireproofing damaged by other trades shall be repaired by fireproofing applicator and paid for by the trade(s) causing damage.

3.07 CLEANING
   A. Except as detailed, surfaces are to be left in a scraped clean condition.
   B. At completion of fireproofing work, application equipment shall be removed from site.

END OF SECTION
SECTION 08130

STAINLESS STEEL DOORS AND FRAMES

PART 1 GENERAL

1.01 DESCRIPTION

A. Section Includes:

1. Standard interior stainless steel doors and frames

1.02 RELATED SECTIONS

1. Section 05120 – Structural Steel, for post-installed concrete anchoring

2. Section 08710 - Door Hardware, for door hardware for hollow metal doors.

3. Section 04220 – Concrete Masonry Units

1.03 REFERENCES

A. American Society of Testing Materials (ASTM): Materials and testing standards as identified throughout this Section.

1. A153 Zinc Coating (Hot-Dip) on Iron and Steel Hardware

2. C236 Test Method for Steady State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box

3. C976 Test Method for Thermal Performance of Building Assemblies by Means of a Calibrated Hot Box

4. E152 Fire Tests of Door Assemblies


C. Door Hardware Institute (DHI): Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.

D. National Fire Protection Association (NFPA):


E. Steel Door Institute (SDI):
   1. ANSI/SDI-100 Recommended Specifications for Standard Steel Doors and Frames
   2. ANSI/SDI-105 Recommended Erection Instructions for Steel Frames
   3. ANSI/SDI-117 Manufacturing Tolerances Standard Steel Doors and Frames

F. Underwriters Laboratories (UL): UL 10B, Fire Tests for Door Assemblies.

G. Definitions:
   1. Minimum Thickness: Minimum thickness of base metal without coatings.

1.04 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, fire-resistance rating, and finishes.

B. Shop Drawings: Include the following:
   1. Elevations of each door design.
   2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
   3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
   4. Locations of reinforcement and preparations for hardware.
   5. Details of each different wall opening condition.
   6. Details of anchorages, joints, field splices, and connections.
   7. Details of accessories.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Other Action Submittals:
1. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of hollow metal door and frame assembly.

**1.05 QUALITY ASSURANCE**

A. Applicable Standards: Specifications and standards of SDI 100-98.

B. Supplier Qualification: Qualified direct distributor of products to be furnished. The distributor shall have in their regular employment an A.H.C./C.D.C. or person of equivalent experience who will be available at reasonable times to consult with the Architect, Contractor and/or Owner regarding any matters affecting the total door and frame openings.

C. Source Limitations: Obtain hollow metal work from single source from single manufacturer.

D. Installer Qualification: Experience with installation of similar materials.

E. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated or required, provide fire-rated door and frame assemblies that comply with NFPA 80 "Standard for Fire Doors and Windows", and have been tested, listed, and labeled in accordance with ASTM E152 "Standard Methods of Fire Tests of Door Assemblies" by nationally recognized independent testing and inspection agency acceptable to authorities having jurisdiction.

F. Oversize Fire-Rated Door Assemblies: For door assemblies required to be fire-rated and exceeding sizes of tested assemblies, provide certificate or label from approved independent testing and inspection agency, indicating that door and frame assembly conforms to requirements of design, materials and construction as established by individual listings for tested assemblies.

G. Temperature Rise Rating: At stairwell enclosures, provide doors which have Temperature Rise Rating of 450 degrees F maximum in 30 minutes of fire exposure.

H. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.
I. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.

1. Provide additional protection to prevent damage to finish of factory-finished units.

B. Store doors and frames under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch- (102-mm-) high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Amweld Building Products, LLC.
2. Benchmark; a division of Therma-Tru Corporation.
3. Ceco Door Products; an Assa Abloy Group company.
4. Or Engineer’s approved equal

2.02 MATERIALS

A. Stainless-Steel Sheet: ASTM A 240/A 240M, austenitic stainless steel, Type 316.

B. Frame Anchors:

1. ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.
2. Stainless-steel sheet. Same type as door face.

C. Inserts, Bolts, and Fasteners:
   1. Hot-dip galvanized according to ASTM A 153/A 153M.
   2. Stainless-steel components complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Alloy Group 1 or 4) for bolts and nuts.

D. Louvers: Comply with requirements in Division 10 Section 10200 "Metal Louvers."

2.03 STAINLESS STEEL DOORS

A. General: Fabricate 1-3/4 inches thick stainless-steel doors of 2 outer stainless-steel sheets, minimum 0.0625-inch thick, 16 gage, permanently and continuously bonded or welded to ridge internal stainless steel core. Construct doors with smooth, flush surfaces without visible joints or seams on exposed faces or stile edges, except around glazed or louvered panel inserts.

   1. Internal Construction: Vertically reinforced with 0.0500-inch thick stainless steel sheet sections, spaced not more than 6 inches o.c. extended full-door height, and spot welded to both face sheets at not more than 5 inches o.c.

   2. Reinforce tops and bottoms of doors with 0.0500-inch thick, stainless steel horizontal channels spot welded a maximum of 6 inches o.c. to door face.

B. Hardware Reinforcement: Stainless steel reinforcing plates for hinges and pivots locksets, flush bolts, closers, exit devices, and other hardware specified in Section 08710.

C. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

2.04 FRAME ANCHORS

A. Jamb Anchors: Masonry Construction. Adjustable, flat, corrugated, or perforated T-shaped to suit frame size, with leg not less than 2 inches wide by 10 inches long. Provide at least 3 anchors for jambs up to 90 inches in height; 4 anchors for jambs up to 96 inches in height, and one additional anchor for each 24 inches or fraction thereof over 96 inches in height.
B. Head: Provide minimum of two (2) anchors at frames over 2'-6" wide; 24 inches on center, maximum.

C. Floor Anchors: Formed from same material as frames, not less than 0.042 inch (1.0 mm) thick, and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

2.05 FABRICATION

A. Fabricate doors and frames to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Tolerances: Fabricate doors and frames to tolerances indicated in SDI 117.

C. Stainless Steel Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.

4. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Keep holes clear during construction.

   a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.

   b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

D. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.
E. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section 08710 "Finish Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive non-templated, mortised and surface-mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 16 Sections.

2.06 STEEL FINISHES

A. Stainless Steel Finish:

1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

2. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
   a. Run grain of directional finishes with long dimension of each piece.
   b. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
   c. Directional Satin Finish: No. 4.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
3.02 INSTALLATION

A. General: Install doors and frames plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Frames: Install custom steel frames for doors of size and profile as indicated.
   1. Install frames and accessories according to manufacturer’s installation instructions and as specified.
   2. Placing Frames: Comply with provisions of SDI 105, unless otherwise indicated. Set frames accurately in position, plumb, align, and brace securely until anchors are set. After wall construction is complete, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
      a. Except for frames located in existing concrete or masonry construction, place frames before constructing enclosing walls and ceilings.
      b. In masonry construction, install at least 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb.
      c. At existing concrete or masonry construction, install at least 3 hinge jamb and at corresponding heights on strike jamb. Set frames and secure to adjacent construction with bolts and masonry anchorage devices.
      d. Install fire-rated frames according to NFPA 80.

C. Door Installation: Fit doors accurately in frames, within clearances specified in ANSI/SDI 100.
   1. Fire-Rated Doors: Install with clearances specified in NFPA 80.
   2. Smoke-Control Doors: Comply with NFPA 105.

3.03 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
B. Remove grout and other bonding material from doors and frames immediately after installation.

C. Stainless Steel Touchup: Immediately after erection, smooth any abraded areas of stainless steel and polish to match undamaged finish.

END OF SECTION
SECTION 08410

ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1  GENERAL

1.01 DESCRIPTION

A. Exterior storefront framing.

B. Exterior manual-swing entrance doors and door-frame units.

1.02 RELATED SECTIONS

A. Section 01300: Submittals

B. Section 01400: Quality Requirements

C. Section 08710: Door Hardware

1.03 REFERENCES

A. ADA/ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disability Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities."

1.04 PERFORMANCE REQUIREMENTS

A. General Performance: Aluminum-framed systems shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:

1. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.

2. Dimensional tolerances of building frame and other adjacent construction.

3. Failure includes the following:
   a. Deflection exceeding specified limits.
   b. Thermal stresses transferring to building structure.
c. Framing members transferring stresses, including those caused by thermal and structural movements to glazing.

d. Glazing-to-glazing contact.

e. Noise or vibration created by wind and by thermal and structural movements.

f. Loosening or weakening of fasteners, attachments, and other components.

g. Sealant failure.

h. Failure of operating units.

B. Delegated Design: Design aluminum-framed systems, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

C. Structural Loads:

1. Wind Loads.
   a. Basic Wind Speed: 90 mph.

D. Deflection of Framing Members:

1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane shall not exceed L/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19 mm), whichever is less.

E. Air Infiltration: Provide aluminum-framed systems with maximum air leakage through fixed glazing and framing areas of [0.06 cfm/sq. ft. of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure difference of [6.24 lbf/sq. ft. (300 Pa)].

F. Water Penetration under Static Pressure: Provide aluminum-framed systems that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than [6.24 lbf/sq. ft. (300 Pa)]
G. Water Penetration under Dynamic Pressure: Provide aluminum-framed systems that do not evidence water leakage through fixed glazing and framing areas when tested according to AAMA 501.1 under dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than [6.24 lbf/sq. ft. (300 Pa)]

1. Maximum Water Leakage: [According to AAMA 501.1] [No uncontrolled water penetrating aluminum-framed systems or water appearing on systems' normally exposed interior surfaces from sources other than condensation]. Water leakage does not include water controlled by flashing and gutters that is drained to exterior and water that cannot damage adjacent materials or finishes.

H. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2. Test Performance: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.

   a. High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F (82 deg C)

   b. Low Exterior Ambient-Air Temperature: 0 deg F (minus 18 deg C)

3. Interior Ambient-Air Temperature: 75 deg F (24 deg C)

I. Condensation Resistance: Provide aluminum-framed systems with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than [53] when tested according to AAMA 1503.

J. Thermal Conductance: Provide aluminum-framed systems with fixed glazing and framing areas having an average U-factor of not more than [0.57 Btu/sq. ft. x h x deg F (3.23 W/sq. m x K)] when tested according to AAMA 1503.
1.05 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for aluminum-framed systems.

1. Product Data for adhesives and sealants used inside of the weatherproofing system, including printed statement of VOC content.

B. Shop Drawings: For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other work.

1. Include details of provisions for system expansion and contraction and for drainage of moisture in the system to the exterior.

2. For entrance doors, include hardware schedule and indicate operating hardware types, functions, quantities, and locations.

C. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

D. Other Action Submittals:

1. Entrance Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

E. Delegated-Design Submittal: For aluminum-framed systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Detail fabrication and assembly of aluminum-framed systems.

2. Include design calculations.

F. Qualification Data: For qualified Installer.

G. Preconstruction Test Reports: For sealant.
H. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for aluminum-framed systems, indicating compliance with performance requirements.

I. Maintenance Data: For aluminum-framed systems to include in maintenance manuals.

J. Warranties: warranties specified in this Section.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer’s authorized representative who is trained and approved for installation of units required for this Project.

B. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.

C. Engineering Responsibility: Prepare data for aluminum-framed systems, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in systems similar to those indicated for this Project.

D. Product Options: Information on Drawings and in Specifications establishes requirements for systems’ aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.

1. Do not revise intended aesthetic effects, as judged solely by Engineer/Architect, except with Engineer/Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Engineer/Architect for review.


F. Source Limitations for Aluminum-Framed Systems: Obtain from single source from single manufacturer.


1.07 DELIVERY, STORAGE, AND HANDLING
A. Deliver Storefronts palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.

1. Provide additional protection to prevent damage to finish of factory-finished units.

B. Store under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on a minimum 4-inch- (102-mm-) high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch (6-mm) space between each stacked unit to permit air circulation.

1.08 JOB CONDITIONS

A. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.

1.09 WARRANTY

A. Warranty: Manufacturer’s standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including, but not limited to, excessive deflection.

b. Noise or vibration caused by thermal movements.

c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

d. Adhesive or cohesive sealant failures.

e. Water leakage through fixed glazing and framing areas.

f. Failure of operating components.

2. Warranty Period: Five years from date of Final Acceptance

1.10 MAINTENANCE SERVICE
A. Entrance Door Hardware:

1. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for SEPTA’s continued adjustment, maintenance, and removal and replacement of entrance door hardware.

2. Initial Maintenance Service: Beginning at Final Acceptance, provide six months’ full maintenance by skilled employees of entrance door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper entrance door hardware operation at rated speed and capacity. Provide parts and supplies the same as those used in the manufacture and installation of original equipment.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Basis-of-Design Product: Comparable product by one of the following:

1. Thomas Manufacturing Inc.
2. Arcadia, Inc.
3. Arch Aluminum & Glass Co., Inc.
4. CMI Architectural
5. Commercial Architectural Products, Inc.
6. EFCO Corporation.
7. Kawneer North America; an Alcoa company.
8. Leed Himmel Industries, Inc.
10. TRACO.
11. Tubelite.

12. United States Aluminum.

13. Vistawall Architectural Products; The Vistawall Group; a Bluescope Steel company.

14. YKK AP America Inc.

15. Or Engineer’s approved Equal

### 2.02 MATERIALS

**A. Aluminum:** Alloy and temper recommended by manufacturer for type of use and finish indicated.


2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).


4. Structural Profiles: ASTM B 308/B 308M.

5. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.

**B. Steel Reinforcement:** Manufacturer’s standard zinc-rich, corrosion-resistant primer, complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.

1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.

2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.

3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

**C. Framing Systems:**

1. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.

b. Glazing System: Retained mechanically with gaskets on four sides.

c. Glazing Plane: As indicated.

2. Brackets and Reinforcements: Manufacturer’s standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

3. Fasteners and Accessories: Manufacturer’s standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
   a. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
   b. Reinforce members as required to receive fastener threads.
   c. Use exposed fasteners with countersunk Phillips screw heads, fabricated from stainless steel.

4. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts, complying with ASTM A 123/A 123M or ASTM A 153/A 153M.

5. Concealed Flashing: Manufacturer’s standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials. Dead-soft, 0.018-inch- (0.457-mm-) thick stainless steel, ASTM A 240/A 240M of type recommended by manufacturer.

6. Framing System Gaskets and Sealants: Manufacturer’s standard, recommended by manufacturer for joint type.
   a. Provide sealants for use inside of the weatherproofing system that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

D. Glazing Systems:

1. Glazing: As specified in Section 08800: Glazing.

2. Glazing Gaskets: Manufacturer’s standard compression types; replaceable, molded or extruded, of profile and hardness required to maintain watertight seal.

E. Entrance Door Systems:

1. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.
   a. Door Construction: 1-3/4-inch overall thickness, with minimum 0.125-inch-thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
      1) Thermal Construction: High-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior.
   b. Door Design: As indicated in contract drawings
   c. Glazing Stops and Gaskets: Square, snap-on, extruded-aluminum stops and preformed gaskets.
      1) Provide non-removable glazing stops on outside of door.

2. Entrance Door Hardware: As specified in Division 08 Section 08710 - Door Hardware.

F. Entrance Door Hardware:

1. General: Provide entrance door hardware and entrance door hardware sets indicated in Section 08710 - Door Hardware for each entrance door to comply with requirements in this Section.
   a. Entrance Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and equivalent in function and comparable in quality to named products.
   b. Opening-Force Requirements:
      1) Egress Doors: Not more than 15 lbf (67 N) to release the latch and not more than 30 lbf ((133 N)) to set the door in motion and not
more than 15 lbf (67 N) to open the door to its minimum required width.

2. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of entrance door hardware are indicated in Section 08710 - Door Hardware. Products are identified by using entrance door hardware designations as follows:

   a. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Section 08710 - Door Hardware

3. Opening-Force Requirements:

   a. Latches and Exit Devices: Not more than 15 lbf (67 N) required to release latch.

G. Accessory Materials

1. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Section 07900 - Joint Sealers.

   a. Provide sealants for use inside of the weatherproofing system that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30-mil (0.762-mm) thickness per coat.

2.03 FABRICATION

   A. Form or extrude aluminum shapes before finishing.

   B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

   C. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
1. Profiles that are sharp, straight, and free of defects or deformations.

2. Accurately fitted joints with ends coped or mitered.

3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.

4. Physical and thermal isolation of glazing from framing members.

5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.


7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

E. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.

F. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.

1. At exterior doors, provide compression weather stripping at fixed stops.

G. Entrance Doors: Reinforce doors as required for installing entrance door hardware.

1. At exterior doors, provide weather sweeps applied to door bottoms.

H. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

I. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.
2.04 FINISHES

A. Finish to match existing storefront.

PART 3  EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. General:

1. Comply with manufacturer’s written instructions.

2. Do not install damaged components.

3. Fit joints to produce hairline joints free of burrs and distortion.

4. Rigidly secure nonmovement joints.

5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.

6. Seal joints watertight unless otherwise indicated.

B. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or applying sealant or tape, or by installing nonconductive spacers as recommended by manufacturer for this purpose.

2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
D. Set continuous sill members and flashing in full sealant bed as specified in Section 07920 - Joint Sealants to produce weathertight installation.

E. Install components plumb and true in alignment with established lines and grades, and without warp or rack.

F. Install glazing as specified in Section 08800 - Glazing.
   1. Structural-Sealant Glazing:
      a. Prepare surfaces that will contact structural sealant according to sealant manufacturer's written instructions to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.
      b. Install weatherseal sealant according to Division 07 Section 07920 "Joint Sealants" and according to sealant manufacturer's written instructions to produce weatherproof joints. Install joint filler behind sealant as recommended by sealant manufacturer.

G. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.
   1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
   2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

H. Install perimeter joint sealants as specified in Section 07920 - Joint Sealants, to produce weathertight installation.

3.03 ERECTION TOLERANCES

A. Install aluminum-framed systems to comply with the following maximum erection tolerances:
   1. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet (3 mm in 3.7 m); 1/4 inch (6 mm) over total length.
   2. Alignment:
a. Where surfaces abut in line, limit offset from true alignment to 1/16 inch (1.5 mm).

b. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch (0.8 mm).

B. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch (3 mm).

3.04 ADJUSTING

A. Adjust operating entrance door hardware to function smoothly as recommended by manufacturer.

1. For entrance doors accessible to people with disabilities, adjust closers to provide a 3-second closer sweep period for doors to move from a 70-degree open position to 3 inches (75 mm) from the latch, measured to the leading door edge.

END OF SECTION
SECTION 08710
DOOR HARDWARE

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Work of this section, as shown or specified shall be in accordance with the contract documents.

1.02 WORK INCLUDES

A. Work of this Section includes all labor, materials, equipment and services necessary to furnish all the finish hardware as shown on the drawings and specified herein.

1.03 RELATED WORK

A. General Conditions.
B. Supplementary Conditions.
C. Division 1.
D. Section 08130 – Stainless Steel doors and frames.
E. Section 09910 - Painting.

1.04 REFERENCES

A. American National Standards Institute - ANSI 156.18 - Materials and Finishes.
B. ANSI A117.1 - Specifications for making buildings and facilities usable by physically handicapped people.
C. BHMA - Builders Hardware Manufacturers Association.
D. DHI - Door and Hardware Institute.
E. NFPA - National Fire Protection Association
F. NFPA 80 - Fire Doors and Windows.
G. NFPA 105 - Smoke and Draft Control Door Assemblies.
H. NFPA 252 - Fire Tests of Door Assemblies.
I. UL - Underwriters Laboratories.


K. SDI - Steel Door Institute.

L. WDI - Wood Door Institute.

M. AWI - Architectural Woodwork Institute.

N. NAAM - National Association of Architectural Metal Manufacturers.

1.05 QUALITY ASSURANCE

A. Hardware: shall be suitable and adapted for its required use and shall fit its designated location. Should any hardware as shown, specified or required fail to meet the intended requirements or require modification to suit or fit the designated location, determine the correction or modification necessary and notify the Architect in ample time to avoid delay in the manufacture and delivery of hardware.

B. Fire rated openings: provide hardware complying with NFPA Standard No. 80 requirements of authorities having jurisdiction.

C. Hardware Supplier Qualifications: The Hardware Supplier shall have been regularly engaged in the sale and distribution of Finish Hardware for projects of comparable scope and size. The Hardware Supplier shall have an AHC of the Door and Hardware Institute on staff who will be responsible for overseeing the scheduling, detailing, ordering, and coordinating of Finish Hardware, and shall be available for consultation with the Architect, at no additional cost to the Owner, during progress of construction. The Hardware Supplier shall be a direct factory authorized distributor for all Finish Hardware items being furnished in accordance with this Specification.

1.06 SUBMITTALS

A. Submittals: shall be in accordance with Conditions of the Contract, Division 1, and Specification sections.

B. Hardware submission: Submit hardware schedule in vertical format as illustrated by the “Sequence and Format for Hardware Schedule” pamphlet published by the Door and Hardware Institute. Schedules which do not comply will be returned for correction before checking.

C. Hardware schedule shall clearly indicate architect’s hardware set and manufacturer of each item proposed.

D. Hardware Supplier shall provide all product information, wiring diagrams,
and electrical data to the Electrical Contractor.

E. Samples: Submit samples as requested by Architect. Do not proceed with installation until samples have been approved. Approved samples may be installed in the work after substantial completion of work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Pack finish hardware in manufacturer's containers, complete with trimmings, bolts, screws, washers, etc., as required for application. Each container shall bear a suitable label which shall state the quantity and kind of contents of said container, as well as identifying marks relating to the approved Hardware Schedule and its location in the project.

1. Knobs, handles, pulls and other items of finish hardware with easily damaged finishes shall be individually wrapped before placing in containers and with sufficient sheet cloth or cotton-backed paper which shall be adequately secured all as necessary to protect the finishes.

2. Finish hardware shall be delivered, as directed, to the building site or the factories of the various fabricators of metal or wood work to which such hardware is to be applied. Deliver hardware in the order required and in ample time to permit application at the building, or fabricators' shops, within the time required for the completion of the building.

1.08 JOB CONDITIONS

A. Field Service: The hardware supplier shall assign a competent representative, acceptable to the Architect, to be at the job site each time a major shipment of finish hardware is received. Such representative shall assist in "checking in" these shipments and shall secure a receipt covering the contents of each shipment. In addition, such representative shall be available for immediate call to the job site when, in the opinion of the Architect, his presence is necessary.

B. Templates: Promptly following approval of the Hardware Schedule by the Architect, furnish and deliver template information, to the fabricators, of items to which finish hardware is to be applied.

1. Such deliveries shall be made in ample time to avoid delays in such work of said fabricators. Provide drawings, schedules and detailed information to other trades as necessary for them to accommodate and prepare their work to receive the finish hardware.

C. Cooperation and Coordination: Prior to the installation of any finish hardware, all parties and trades having responsibility to any of all of the openings for the job, shall meet in a pre-construction meeting, for instruction
on the proper installation of finish hardware with the manufacturers representative.

1. Cooperate and coordinate work with that of other trades supplying materials or performing work in contact with, connecting to, underlying, or overlaying the work of this Section.

2. Provide complete data of requirements for work of this Section to those other trades whose work is affected by or dependent upon the work of this Section.

3. Furnish all items to be built into other work in ample time to avoid delaying the progress of such work.

4. Examine all drawings covering the work of this Section and refer to all other drawings, including mechanical and electrical drawings, which may affect the work of this Section or require coordination by this trade.

D. Existing Conditions: Verify all existing conditions in the field to ensure compatibility with hardware specified in the Hardware Sets herein. Any discrepancies between the existing field conditions and hardware specified shall be brought to the attention of the Architect immediately. Hardware Supplier shall not order any hardware until all discrepancies are rectified and the Architect grants written approval.

PART 2 PRODUCTS

2.01 GENERAL

A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware are indicated herein. Products are identified by using appropriate hardware designation numbers.

2.02 MANUFACTURERS

A. Provide hardware as indicated in hardware sets. Products other than those listed in the sets may be considered, provided that they are proven to be of equal quality and have equal performance to those products specified. See product description for each type of product for details on performance and quality requirements. The architect reserves the right to review and approve all proposed equivalents.

B. Additional hardware items: Provide hardware items required to complete the Work in accordance with these specifications and manufacturers’ instructions, including items inadvertently omitted from this specification. Note these items in submittal for review.
2.03 HANGING MEANS

A. Hinges

1. In general, where new hinges are to be provided at existing frames, existing condition must be verified before determining which hinge shall be provided so that new hinges will fit existing frame cut out size and locations.

2. Doors up to 60” in height shall be furnished with two hinges. Furnish one additional hinge for each 30” of door height or fraction thereafter.

3. Hinges shall be of types, sizes and materials as required to suit door weights thickness and fire ratings.

4. Unless otherwise specified, hinges shall be heavy weight. Doors over 3’-4” in width shall receive 5 x 4½ .190 gauge hinges.

5. Hinge sizes shall be detailed so that the least amount of projection shall be visible from the frame.

6. Unless otherwise specified, hinges shall have concealed ball bearings (combination anti-friction or oil impregnated) and three (3) knuckles.

7. All hinges shall have non-rising pins.

8. All keyed reverse bevel doors shall be furnished with non-removable pins.

9. Hinge Series: Ives 3CB1HW series, see hardware sets for sizes.

10. Approved Equals: Stanley CB series , Hager AB series.

2.04 MORTISE LOCKSETS AND LATCHSETS

A. Mortise Locksets

1. Lock cases to be constructed with a protected leading edge and screw configuration that limits access to operating parts.

2. Lock cases are to be multi-functional that transform into different functions without opening the lock case.

3. Lock components to be manufactured of zinc dichromate plated steel. Manufacturers utilizing plastic parts, spacers and/or bushings are not acceptable.

4. Lock components to incorporate a spring loaded fusible link for
Fire/Life Safety. Manufacturers utilizing gravity, fusible link are acceptable.

5. Latch bolts to have a standard 2 ¾” backset with a full ¾” throw.

6. Latch bolts to be non-handed, field reversible without opening the lock case.

7. Latch bolts to be 2-piece anti-friction, manufactured from stainless steel. Solid latch bolts and/or plastic anti-friction devices are not acceptable.

8. Cylinders to be secured by a cast stainless steel, dual retainer. Manufacturers utilizing screws and/or stamped retainers are not acceptable.

9. Manufacturers utilizing an exposed toggle on edge of door as “locked indicator” are not acceptable.

B. Lever Trim

1. Lever assembly (external) to be one-piece design attached by threaded bushing. Lever assembly (internal) shall be attached by screwless shank. Lever attachment by common tools (allen nuts and/or set screws) are not acceptable.

2. Thru-bolt lever assemblies through the door for positive interlock. Manufacturers utilizing a through the door spindle for attachment are not acceptable.

3. Levers to have independent rotation in both directions.

4. Spring cages are to be incorporated into the lever assemblies.

5. Hub blocking plate to be solid, cast stainless steel. Manufacturers utilizing open hub designs are not acceptable.

6. Spindles to be independent, designed to “break-away” at a maximum of 75psi torque.

C. Thumb turns

1. Thumb turn and back-plate to be manufactured from castings and comply with ANSI 117 accessibility standard.

D. Deadbolts

1. Deadbolts to be 1 ¾” total length; have standard 1” throw with a
minimum ¾” internal engagement when fully extended.

2. Deadbolts to be constructed of stainless steel, incorporating a security roller pin with a minimum Rc60 rating for surface hardness.

E. Strikes

1. Strikes to be non-handed and bridged to ensure dead latching. Manufacturers utilizing fillers of any kind for deadlatch engagement are not acceptable.

2. Mounting tabs are to be automatic self adjusting, vertically and horizontally for door bevel and strike alignment.

F. Lock Series & Design: Schlage L Series Heavy Duty Mortise Locks, lever trim as specified in hardware sets


H. Certifications:

1. Provide mortise locksets that comply with ANSI A156.13, Series 1000, Operational Grade 1 and Security Grade 1 with all standard trims.

2. Provide mortise locksets that comply with UL10C and UBC 7-2 positive pressure requirements.

3. Provide mortise locksets that comply with ANSI/ASTM F476-76 Grade 40, UL Listed for locksets utilizing concealed cylinders.

2.05 EXIT DEVICES

A. Exit Devices shall be touch bar type, as specified in hardware sets.

1. Furnish stainless steel touch bars on all exit devices

2. Touch bar and touch bar end caps shall overlap the mechanism case.

3. Touch bar sub assembly shall be minimum .160” thick, with minimum .060 supports.

4. Touch bar surface shall be minimum 2-1/4” high x 18” long for 36” doors, and minimum 2-1/4” high x 24” long for doors wider than 36”.

5. Exit device touch bars shall be equipped with a fluid sound dampening feature.

B. Furnish exit devices, less bottom rod, on all cross corridor pairs of doors,
where doors are for compartmentalization only

C. Rim and Mortise type devices shall have ¾” throw latch bolt. Surface and Concealed Vertical Rod devices shall have 5/8” throw latch bolts.
   1. Latch bolt security deadlocking shall be standard.

D. All fire doors shall receive devices U.L. listed Fire Exit Hardware

E. Furnish roller strikes, which interlock the door to the frame (499F) for all rim devices and surface vertical rod devices.

F. All internal springs shall be compression type.

G. Where lever trim is specified, levers shall match the balance of the project.
   1. Escutcheons of all lever trim shall be forged brass or bronze, with (4) thru-bolts anchoring trim assembly to exit device chassis
   2. Levers shall be solid forged brass or bronze
   3. Lever return springs shall be compression type.
   4. Cylinders shall be recessed from face of escutcheon.

H. Lever trim shall be breakaway type. When rotational force of 35 ft.lbs. is applied, lever trim appears to break. Lever trim can be reset to normal function, without disassembly
   1. Lever shall be protected by a shear pin, which will withstand a rotational force of 55 ft.lbs. before shearing, to prevent further damage to lever. Lever shall not separate from the escutcheon.

I. Furnish all necessary Glass Bead Kits where exit device may interfere with raised glass beads on doors.

J. Certifications:
   1. Devices shall be Underwriters Laboratories™ listed for Panic Hardware (FVSR) SA163
   2. Fire Devices shall be Underwriters Laboratories™ listed Fire Exit Hardware (GXHX) R4501, A Label
   3. Cycle Testing: Exit devices shall be certified by an independent testing lab for 1,000,000 cycles.

K. Exit Device Series & Design: Von Duprin 98/99 series exit devices with Door Hardware 08710-8
outside trim as specified in hardware sets.

L. Approved Equals: Falcon 25 series, Sargent 80 Series.

2.06 CLOSERS

A. All surface closers shall exceed ANSI A156.4 Grade 1 requirements in all aspects as called for below. All closers shall have certification by an independent testing laboratory of 10,000,000 cycles without failure.

B. Closer cylinders shall be cast iron. Closer pinions shall be dual heat treated. Pinion and piston shall be steel alloy. Piston diameter shall be minimum 1-1/2”.

C. Closers shall be barrier free with spring tension adjustable from size 1 to size 5.

D. Closers shall maintain control of the door in all conditions. Closers shall have 3 non critical adjusting valves: latch, main and backcheck. Backcheck shall take affect at 45 (AVB) degrees of opening for parallel arm closers and 70 degrees for regular arm closers. Closers with pressure relief valves are not acceptable.

E. All closers shall have forged main arms. Forearms of parallel arm closers shall be forged. Parallel arm brackets shall be forged. All parallel arm joints shall have bronze bushings with minimum 5/8” diameter pins. Cylinders, arms, brackets and mounting plates shall be powder coated.

F. Provide all plates, brackets and special templates when needed for interface with particular header, door and wall conditions and neighboring hardware. Consult factory for special template (“ST” suffix to closer number) pricing.

G. All closers shall be installed so that closer bodies are positioned on room side of doors to and from corridors. Out-swing doors shall have an extra heavy duty parallel arm (EDA). Parallel arm shall be used on connecting doors between rooms.

H. All exterior closers shall have all weather fluid that does not require seasonal adjustment to control speed of door, and shall exhibit the same viscosity from -30 ° F to +120° F.

I. All closers shall have a powder coated aluminum finish on cylinder, arm and accessories. There shall be a full metal, powder coated cover.

J. Furnish all brackets, drop plates and any other necessary hardware required to insure proper installation.

K. All Closers shall comply with UL 10C requirements for positive pressure
testing.

L. All closers shall be of one manufacturer’s products. All closers shall be inspected after installation by a factory representative to insure proper adjustment and operation.

M. Closer Series: LCN 4011/4111 series.

N. Approved Equals: Falcon SC70 Series, Sargent 281 Series

2.07 DOOR STOPS

A. Unless otherwise noted, all door stops shall be wall mounted with concealed fasteners Ives WS407CCV/CVX series. Where wall stops will not function for the application, furnish floor mounted stops Ives FS436/438 series.

2.08 OVERHEAD STOPS

A. Overhead Stops: Stainless steel. Non-plastic mechanisms and finished metal end caps. Provide field-changeable hold-open, friction and stop-only functions. Coordinate templates for door and wall conditions and neighboring hardware. Furnish drop plates at locations where regular arm closer are used in conjunction with overhead stops. See hardware sets for specific model numbers.

2.09 PROTECTION PLATES

A. All kick plates and mop plates unless otherwise noted shall be 8” high x 2” less door width (LDW), beveled three sides x .050 thick

2.10 FLUSH BOLTS AND COORDINATORS

A. Manual Flush Bolts: Shall be Ives FB458/FB358 series, furnished with DP2 dustproof strikes for all bottom bolts. Top bolts shall be furnished with proper extensions to allow for easy operation.

B. Self Latching Flush Bolts: Shall be Ives FB51P/FB61P series, furnished with DP2 dustproof strikes for all bottom bolts. Furnish wear plates as required.

C. Automatic Flush Bolts: Shall be Ives FB31P/FB41P series, furnished with DP2 dustproof strikes for all bottom bolts. Furnish wear plates as required.

D. Coordinators: Shall be Ives COR series. Furnish all fillers, mounting brackets, carry bars and special cut outs for use with exit devices, as required. Finish shall be black.

2.11 KEY REQUIREMENTS
A. Final keying: requirements to be determined by the Owner. A meeting must take place between the owner, the end user, the owner’s representative, and the hardware distributor prior to cylinders being ordered, to establish the keying requirements and required keyway.

B. Key System: Tie into the existing interchangeable-core key system coordinate with SEPTA Locksmith.

C. Provide Concealed Key Control (CKC) keyset symbol stamping on the side of each master keyed core. Provide visual key control for all operating and master keys.

D. Construction keying: provide brass keyed-alike temporary cores plus 10 operating keys for all cylinders, interior and exterior.

E. Provide: Three (3) change keys for each differently keyed lock. Provide (3) control keys for construction cores, and (3) control keys for permanent cores. Provide 10 copies of each level Master Key, Grand Master Key, and/or Great Grand Master Key. Permanent keys and cores: secured shipment direct from point of origination to the owner. Provide bitting list, ship direct from point of origin to the owner upon project completion.

F. Provide a key control system including envelopes. Labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150 percent of the number of locks required for the project.

1. Provide four hinged panel type cabinet for wall mounting.

2.12 WEATHER SEALS AND THRESHOLDS

A. Weather Seals and Thresholds: Zero as Scheduled.

B. Perimeter seals: shall be of compressible black Neoprene material. Housing shall be solid alum stock. Furnish seals on three sides of the opening. Coordinate the amount of material is required in each specified opening.

C. Seals shall be mechanically fastened to door frame.

D. Door sweeps: shall be extruded aluminum and black neoprene sweep.

1. Fasten door sweeps with wood screws for wood doors and sheet metal screws for hollow metal and fiberglass reinforced doors.

2. Door sweep shall be 1 ¼” in overall height with a ½” high neoprene sweep.
3. Mount door sweep on the exterior side of the door, with the neoprene engaged with the threshold or finish floor.

E. Thresholds: shall be extruded aluminum meeting ADA requirements. They shall not exceed ¼” in height with a wall thickness of .125” unless specified otherwise. Coordinate templates for any and all hardware, which may require cutouts or slots within the threshold for the proper installation of that hardware.

1. Furnish threshold with non-slip epoxy abrasive bonded within the grooves of the threshold.

2. Thresholds shall extend a minimum of 1” past the exterior face of the door, and have returned closed ends.

3. Set all thresholds in grout, and seal with silicone caulk.

4. Fasten thresholds with expansion shield mounting at masonry sub-straight locations, and wood screws at wood substrate locations.

PART 3 EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. Factory trained and certified, and carries a factory-issued card certifying that person as a "Certified Installer”.

3.02 PREPARATION

A. Ensure that walls and frames are square and plumb before hardware installation.

B. The installer shall notify the architect, in writing, of all unacceptable condition that could affect the proper operation of the finish hardware.

C. Locate hardware per SDI-100 and applicable building, fire, life-safety, accessibility, and security codes.

D. Where new hardware is to be installed near existing doors/hardware scheduled to remain, match locations of existing hardware.

E. Existing frames and doors scheduled to receive new hardware: carefully remove existing hardware and turn over to Owner. Patch and fill wood frames and doors with solid wood stock or dowel material before cutting for new hardware. Do not reuse existing screw holes fill and re-pilot.

3.03 INSTALLATION
A. Install hardware per manufacturer’s instructions and recommendations. Do not install surface-mounted items until finishes have been completed on substrate. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation.

1. Unless otherwise specified, locate all hardware in accordance with the recommended locations for builders hardware for standard doors and frames as published by the Door and Hardware Institute.

2. Gaskets: install jamb-applied gaskets before closers, overhead stops, rim strikes, etc. Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps.

3. Unless otherwise specified or detailed, install thresholds with the bevel in vertical alignment with the outside door face. Notch and closely fit thresholds to frame profile. Set thresholds in full bed of sealant.

4. When hardware is to be attached to existing metal surface and insufficient reinforcement exists, use RivNuts, NutSerts or similar anchoring device for screws.

5. Locate floor stops not more than 4 inches from the wall.

6. Drill pilot holes for fasteners in wood doors and/or frames.

7. Shim doors as required to maintain proper operating clearance between door and frame.

8. Use only fasteners supplied by or approved by the manufacturer for each respective item of hardware.

9. Lubricate and adjust existing hardware scheduled to remain. Carefully remove and give to Owner items not scheduled for reuse.

10. Where necessary, adjust doors and hardware as required to eliminate binding between strike and latchbolt. Doors should not rattle.

11. Install door closers on corridor side of lobby doors, room side of corridor doors, and stair side of stairways.

12. Adjust spring power of door closers to insure exterior and fire rated doors will consistently close and latch doors under existing conditions. Adjust all other door closers to insure opening force does not to exceed 5 lbs.

13. Adjust "sweep", "latch", & "back check" valves on all door closers to properly control door through out the opening and closing cycle.
Adjust total closing speed as required to comply with all applicable state and local building codes.

14. Deliver to the owner 1 complete set of installation and adjustment instructions, and tools as furnished with the hardware.

3.04 QUALITY ASSURANCE

A. After installation has been completed, the hardware supplier and manufacturers representative for locksets, door closers, exit devices, and overhead stops shall check the project and verify compliance with installation instructions, adjustment of all hardware items, and proper application according to the approved hardware schedule. Hardware supplier shall submit a list of all hardware that has not been installed correctly.

B. After installation has been completed, the hardware supplier and manufacturers representative shall meet with the owner to explain the functions, uses, adjustment, and maintenance of each item of hardware.

3.05 ADJUSTING AND CLEANING

A. Adjust and check for proper operation and function. Replace units which cannot be adjusted to operate freely and smoothly.

B. At final completion, and when H.V.A.C. equipment is in operation, installer shall make final adjustments to and verify proper operation of all door closers and other items of hardware. Lubricate moving parts with type lubrication recommended by the manufacturer.

C. All hardware shall be left clean and in good operation. Hardware found to be disfigured, defective, or inoperative shall be repaired or replaced.

D. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of space or area, return to work during week prior to acceptance or occupancy, and make final check and adjustment of hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors.

3.06 EXTRA STOCK

A. See hardware sets for additional hardware. Additional hardware is to be delivered directly to the owner for maintenance purposes.

B. Extra screws shall be furnished to the contractor for installation purposes. See hardware sets for a detailed listing of extra screws.

C. All extra hardware items, fasteners, and special installation tools are to be
turned over to the owner at completion of the project.

3.07 DEMONSTRATION

A. Demonstrate electrical, electronic and pneumatic hardware systems, including adjustment and maintenance procedures.

3.08 PROTECTION

A. Cover installed hardware, protect from paint, cleaning agents, weathering, carts/barrows, etc. Remove covering materials and clean hardware just prior to substantial completion.

B. Clean adjacent wall, frame and door surfaces soiled from installation/reinstallation process.

3.09 SCHEDULE OF FINISH HARDWARE

A. See door schedule in drawings for hardware set assignments.

Hardware Group No. 01: Provide each SGL door(s) with the following:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
<th>Model Number</th>
<th>Finish</th>
<th>Mfr</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>HINGE</td>
<td>3CB1HW 4.5 X 4.5 NRP</td>
<td>606</td>
<td>IVE</td>
</tr>
<tr>
<td>1</td>
<td>STOREROOM LOCK</td>
<td>L9080T 17A</td>
<td>606</td>
<td>SCH</td>
</tr>
<tr>
<td>1</td>
<td>MORTISE CLINDER</td>
<td>INTERCHANGEABLE MORTISE CYL.</td>
<td>606</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>TO MATCH KEY SYSTEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>SURFACE CLOSER</td>
<td>4111 EDA</td>
<td>696</td>
<td>LCN</td>
</tr>
<tr>
<td>1</td>
<td>KICK PLATE</td>
<td>8400 8&quot; X 1&quot; LDW</td>
<td>606</td>
<td>IVE</td>
</tr>
<tr>
<td>1</td>
<td>KICK PLATE</td>
<td>8400 8&quot; X 2&quot; LDW</td>
<td>606</td>
<td>IVE</td>
</tr>
<tr>
<td>1</td>
<td>WALL STOP</td>
<td>WS407CCV</td>
<td>606</td>
<td>IVE</td>
</tr>
<tr>
<td>1</td>
<td>SEALS</td>
<td>8144-FS X SIZE AS REQ'D.</td>
<td>AL</td>
<td>ZER</td>
</tr>
<tr>
<td>3</td>
<td>SILENCER</td>
<td>SR64</td>
<td>GRY</td>
<td>IVE</td>
</tr>
</tbody>
</table>

Hardware Group No. 02: Provide stair head house security gates with the following:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
<th>Model Number</th>
<th>Finish</th>
<th>Mfr</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>WELD-ON HINGE</td>
<td>SSWM032FP</td>
<td>316SS</td>
<td>IVE</td>
</tr>
<tr>
<td>2</td>
<td>DEADBOLT</td>
<td>B660P 626</td>
<td>630</td>
<td>SCH</td>
</tr>
</tbody>
</table>

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SECTION 08800
GLAZING

PART 1  GENERAL

1.01  DESCRIPTION

A. Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Laminated glazing at elevator hoistways
2. Glazing for replacement storefront at Discount Store.
3. Sacrificial window film for elevator glazing.

1.02  RELATED SECTIONS

A. Section 01530 – Barriers and Enclosures
B. Section 05501 – Custom Mild Steel Fabrications
C. Section 07900 - Joint Sealers
D. Section 05120 - Structural Steel
E. Section 07620 – Sheet Metal Flashing and Trim

1.03  REFERENCES

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: GANA's "Glazing Manual."

1.04  SUBMITTALS

A. Product Data: For each glass product and glazing material indicated.
1. For glazing sealants used inside of the weatherproofing system, including printed statement of VOC content.

B. Glazing Samples: 4 samples of each type specified.

C. Glazing Accessory Samples: 4 6"x6" samples of each accessory specified.

D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

E. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

F. Qualification Data: For manufacturers of insulating-glass units with sputter-coated, low-e coatings and sealant testing agency.

G. Product Certificates: For glass and glazing products, from manufacturer.

H. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency.

  1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.

I. Preconstruction adhesion and compatibility test report.

J. Warranties: Warranties as Specified in This Section

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer.

B. Installer Qualifications: Installer of glazing is a certified installer with a documented history installing manufacturer’s products according to manufacturer’s specifications.

C. A qualified installer who employs glass installers for this Project who are certified under the National Glass Association’s Certified Glass Installer Program.

D. Preconstruction Testing:
1. Preconstruction Adhesion and Compatibility Testing: Test each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.

2. Testing will not be required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

3. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.

4. Test no fewer than eight Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.

5. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.

6. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including the use of specially formulated primers.

E. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.

F. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

G. Source Limitations for Glass: Obtain all glass from single source from single manufacturer for each glass type.

H. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

I. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

J. Fire-Protection-Rated Glazing Labeling: Permanently mark fire-protection-rated glazing with certification label of a testing agency
acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, test standard, whether glazing is for use in fire doors or other openings, whether or not glazing passes hose-stream test, whether or not glazing has a temperature rise rating of 450 deg F (250 deg C), and the fire-resistance rating in minutes.

K. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

L. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

M. Preinstallation Conference: Conduct conference at Project site.

   1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   2. Review temporary protection requirements for glazing during and after installation.

N. Project Conditions:

   1. Environmental Limitations:

      a. Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
      b. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F (4.4 deg C).

   2. Verify actual measurements for openings by field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

O. Definitions:

   1. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
2. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
3. Interspace: Space between lites of an insulating-glass unit.

P. All newly installed materials shall be asbestos free.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.07 WARRANTY

A. Manufacturer's Standard Warranty on Insulating Glass: Manufacturer's standard form in which insulating-glass manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

B. Warranty Period: 5 years from date of Final Acceptance.

PART 2 PRODUCTS

2.01 MATERIALS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AFG Industries Inc.
2. PPG Industries
3. Libbey-Owens-Ford Co.
4. Or Engineer’s Approved Equal
B. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.

1. Minimum Glass Thickness for Exterior Lites: as indicated on contract drawings

C. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.

D. Windborne-Debris-Impact Resistance: Provide exterior glazing that passes basic-protection testing requirements in ASTM E 1996 when tested according to ASTM E 1886. Test specimens shall be no smaller in width and length than glazing indicated for use on the Project and shall be installed in same manner as glazing indicated for use on the Project.

E. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. For laminated-glass lites, properties are based on products of construction indicated.

2. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).

3. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.

4. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.02 LAMINATED GLASS

A. Laminated Glass: ASTM C 1172, and complying with testing requirements in 16 CFR 1201 for Category II materials, and with other requirements specified. Use materials that have a proven
record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.

1. **Construction:** Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written recommendations.

2. **Interlayer Thickness:** Provide thickness not less than that indicated and as needed to comply with requirements.

3. **Interlayer Color:** Clear unless otherwise indicated.

**B. Windborne-Debris-Impact-Resistant Laminated Glass:**

ASTM C 1172, and complying with testing requirements in 16 CFR 1201 for Category II materials, with "Windborne-Debris-Impact Resistance" Paragraph in "Glass Products, General" Article, and with other requirements specified. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.

1. **Construction:** Laminate glass with one of the following to comply with interlayer manufacturer's written recommendations:

   a. Polyvinyl butyral interlayer.

   b. Polyvinyl butyral interlayers reinforced with polyethylene terephthalate film.

   c. Ionoplast interlayer.

   d. Cast-in-place and cured-transparent-resin interlayer.

   e. Cast-in-place and cured-transparent-resin interlayer reinforced with polyethylene terephthalate film.

2. **Interlayer Thickness:** Provide thickness not less than that indicated and as needed to comply with requirements.

3. **Interlayer Color:** Clear unless otherwise indicated.

**C. Glass:** Comply with applicable requirements in "Glass Products" Article as indicated by designations as "Laminated-Glass Types".

### 2.03 GLAZING GASKETS
A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one of the following:

1. Neoprene complying with ASTM C 864.
2. EPDM complying with ASTM C 864.
4. Thermoplastic polyolefin rubber complying with ASTM C 1115.

B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned neoprene, EPDM, silicone or thermoplastic polyolefin rubber gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.

1. Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.

C. Lock-Strip Gaskets: Neoprene extrusions in size and shape indicated, fabricated into frames with molded corner units and zipper lock-strips, complying with ASTM C 542, black.

2.04 GLAZING SEALANTS

A. General:

1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. VOC Content: For sealants used inside of the weatherproofing system, not more than 250 g/L when calculated according to 40 CFR 59, Subpart D.
4. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   
a. Dow Corning Corporation; 790.
   b. GE Advanced Materials - Silicones; SilPruf LM SCS2700.
   d. Pecora Corporation; 890.
   e. Sika Corporation, Construction Products Division; SikaSil-C990.
   f. Tremco Incorporated; Spectrem 1.
   g. Or Engineer’s Approved Equal

2.05 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.06 MISCELLANEOUS GLAZING MATERIALS
A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

F. Perimeter Insulation for Fire-Resistive Glazing: Product that is approved by testing agency that listed and labeled fire-resistant glazing product with which it is used for application and fire-protection rating indicated.

2.07 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

2.08 SACRIFICIAL WINDOW FILM “VANDAL SHIELD”

A. Manufacturers:

1. GPFilms Inc., 575 Maryville Centre Drive, St Louis, MO 63141; 800-851-7781; www.llumar.com

2. Graffiti removal Inc., Po Box 2991, La Habra, CA 90632; 909-464-2700; www.vandalshield.com


4. Or engineer’s approved equal.
B. Product Description: Multi-layered product, 4 mils thick, applied to interior glass surfaces, consisting of from outboard surface to inboard surface:

1. Removable release liner.
2. Pressure sensitive adhesive.
3. Clear, dyed or metalized layers of polyester film.
4. Scratch resistant coating.

C. Colors: Clear.

D. Glazing film accessories

1. General: Provide products complying with requirements of glazing film manufacturer for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

2. Adhesive: Pressure sensitive acrylic adhesive system.

3. Cleaners, Primers, and Sealers: Types recommended by glazing film manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.

2. Presence and functioning of weep systems.

3. Minimum required face and edge clearances.

4. Effective sealing between joints of glass-framing members.

5. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Sacrificial window film

1. Examine glass and surrounding adjacent surfaces for conditions affecting installation.
a. Report conditions that may adversely affect installation. In report, include description of any glass that is broken, chipped, cracked, abraded, or damaged in any way.

2. Proceed with installation only after unsatisfactory conditions have been corrected.


3.02 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

3.03 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
G. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.

2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

J. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

K. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

L. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

M. Sacrificial window film

1. Comply with manufacturer's written instructions for surface preparation.

2. Immediately before beginning installation of films, clean glass surfaces of substances that could impair glazing film's bond, including mold, mildew, oil, grease, dirt and other foreign materials.

3. Protect glazing frames and surrounding conditions from damage during installation.
3.04 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until right before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.05 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.06 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.07 LOCK-STRIP GASKET GLAZING

A. Comply with ASTM C 716 and gasket manufacturer's written instructions. Provide supplementary wet seal and weep system unless otherwise indicated.

3.08 CLEANING AND PROTECTION

A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction,
but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Final Acceptance. Wash glass as recommended in writing by glass manufacturer.

F. Sacrificial window film

1. Remove excess mounting solution at finished seams, perimeter edges, and adjacent surfaces.
2. Use cleaning methods recommended by glazing film manufacturer.
3. Replace films that cannot be cleaned.

END OF SECTION
SECTION 09306
BRIDGEPLATES

PART 1 – GENERAL REQUIREMENTS

1.1 DESCRIPTION

A. The work in this Section includes forty-eight inch long aluminum bridgeplates

B. Provide all materials, labor, equipment, and services necessary to perform the work of this section.

1.2 INTENT

A. Bridgeplates are defined as movable ramps used by individuals in wheelchairs and other mobility aids to span the horizontal gap between passenger platforms and train cars.

B. Bridgeplates shall be designed and constructed so as to be compliant with applicable provisions of the Americans with Disabilities Act (ADA) and ICC A117.1 current edition.

C. Bridgeplates shall be designed and constructed in such a way that persons in wheelchairs or other mobility aids are able to use them safely and easily.

D. Bridgeplates shall be designed and constructed in such a way that they are safe and easy to manage by SEPTA personnel.

E. Bridgeplates shall be designed and constructed in such a way that they cannot be damaged (cracked, split, delaminated, racked, warped, or changed in any way) over the life of the product due to exposure to sun, climate, normal operations, and simple vandalism.

F. The life of the product is defined as 10 years.

G. Bridgeplates shall be forty-eight (48) inches long and shall be properly configured and dimensioned.

1.3 QUALITY ASSURANCE

A. Reference Standards

1. Comply with applicable provisions and recommendations of the latest edition of the following:

   Aluminum Bridge Plates 09306-1
a. Americans with Disabilities Act (ADA).

1.4 SUBMITTALS

A. Shop drawings, catalogue cuts, and test reports

1. Submit three (3) sets of shop drawings, catalogue cuts, and test reports for review.
2. Shop drawings shall show all dimensions, thicknesses, configurations, materials, colors, finishes, and methods of attachment.
3. Do not manufacture bridgeplates until shop drawings, catalogue cuts, and test reports have been approved by SEPTA.

B. Prototype

1. Submit a prototype for review by SEPTA.
2. Prototypes shall show all dimensions, thicknesses, configurations, materials, colors, finishes, and methods of attachment.
3. Do not manufacture bridgeplates until the prototype(s) have been approved by SEPTA.
4. An approved prototype may be incorporated into the work as determined by the SEPTA project manager.

1.5 PACKAGING, DELIVERY, AND LABELING

A. Packaging

1. Package each bridgeplate in an enclosed cardboard box to prevent damage during shipment
2. Clearly indicate on each package its contents, size, and quantity.
3. Clearly identify on each package any storage restrictions.

B. Delivery

1. Deliver bridgeplates to SEPTA Bridges and Buildings Department:
   
   Broad and Lehigh Yard
   
   1326 W. Lehigh Avenue
   
   Philadelphia, PA 19132

2. The Contractor is responsible for all delivery costs, including but not limited to taxes, tariffs, shipping, handling, and insurance.
3. Notify SEPTA seven (7) days prior to delivery.
C. Labeling

1. Bridgeplates shall be affixed with a permanent label on the underside.
2. This label shall identify the manufacturer, his address, and the year that the bridgeplates was manufactured.
3. This label shall also state that the bridgeplate is fully compliant with the Americans with Disabilities Act (ADA), most recent version.

PART 2 – PRODUCTS

2.1 MATERIAL

A. General

1. Each bridgeplate shall consist of a ramp, nosing, non-slip walking surface, curbs, and a bottom handhold. The bottom handhold shall also function as a stability stop.
2. Components shall be joined with welds, fasteners, and adhesives.

B. Ramp

1. Ramp shall be comprised of a sequence of ramp extrusions.
2. Ramp extrusion shall be the SEPTA standard and the Contractor can obtain the extruded material from Aluminum Shapes, LLC, 856-662-5500.
   a. Die #82112
3. Ramp material shall be aluminum 6063-T52 alloy.
4. Ramp extrusions shall be welded together and the welds shall be ground smooth.

C. Walking Surface

1. Walking surface shall be industrial grade sheet material meeting the intent of Section 1.02, meaning that it shall be a product that cannot be damaged (cracked, split, delaminated, racked, warped, or changed in any way) over the life of the product due to exposure to sun, climate, normal operations, and simple vandalism.
2. Walking surface shall be permanently adhered to the top of the ramp.
3. Walking surface shall have a slip resistance of 0.8 minimum dry and 0.8 minimum wet when tested per ASTM C1 026-96, Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull.
Method. Submit a Test Report showing compliance with this requirement.

4. Walking surface shall have a 2 inch painted edge along each curb.
5. Painted edge shall meet the intent of Section 1.02 meaning that is shall be a product that cannot be damaged (cracked, split, delaminated, racked, warped, or changed in any way) over the life of the product due to exposure to sun, climate, normal operations, and simple vandalism.

D. Curbs

1. Curb material shall be aluminum angles.
2. Aluminum angles shall be 6063-T52 alloy.
3. Curbs shall be fabricated with handhold openings.
4. Curbs shall be welded to ramp extrusions

E. Bottom Handhold

1. Ramps shall have one bottom handhold. This shall also function as a stability stop.
2. Bottom hand holds shall be bent aluminum rod.
3. Aluminum rod shall be 6061-T6511 alloy.
4. Bottom hand holds shall be welded to ramp extrusions.

PART 3 – EXECUTION

3.1 CONSTRUCTION

A. General

1. Bridgeplates shall be constructed in such a way that they cannot be damaged (cracked, split, delaminated, racked, warped, or changed in any way) over the life of the product due to exposure to sun, climate, normal operations, and simple vandalism.
2. Apply epoxy, walking surface sheet, and painted edge as recommended by the manufacturers of the products selected. Submit complete manufacturer’s literature.
3. Perform welding in compliance with applicable AWS requirements.
4. After all welding is complete and prior to installation of the walking surface and nosings, apply a clear anodized finish to all aluminum. Anodizing shall comply with ASTM B580, and the minimum thickness of the coating shall be 18.

B. Loading

1. Per the ADA bridge plates 30 inches or longer shall support a load of 600 pounds, placed at the centroid of the bridge plate distributed over Aluminum Bridge Plates 09306-4
an area of 26 inches by 26 inches, with a safety factor of at least 3 based on the ultimate strength of the material.

C. Weight

1. Bridgeplates shall be as light as possible so as to prevent injury to the personnel handling them.
   a. The weight of the forty-eight (48) inch bridgeplate shall be no greater than 30 pounds
PART 1   GENERAL

1.01   DESCRIPTION

A. Provide replacement tile as required from demolition work.
B. Ceramic wall tile at platform level work areas

1.02   RELATED SECTIONS

A. Section 01400 – Quality Requirements
B. Section 02070 – Selective Demolition
C. Section 07900 – Joint Sealers
D. Section 09250 – Gypsum Board
E. Section 09330 – Quarry Tile

1.03   REFERENCES

A. American National Standards Institute (ANSI):

1. ANSI A137.1 – Standard Specification for Ceramic Tile
2. ANSI A136.1 – Standard Specification for the Installation of Ceramic Tile
4. ANSI 108.1 – Standard Specification for the Installation of Ceramic Tile in the Wet-Set Method

B. American Society for Testing and Materials (ASTM):

2. ASTM C207 – Standard Specification for Hydrated Lime for Masonry Purposes
5. ASTM C926 – Standard Specification for Application of Portland Cement Based Plaster

D. Metal Lath/Steel Framing Association Division of NAMM (ML/SFA): Specifications for lathing and furring

E. Ceramic Tile Institute (CTI) Standard No. 69-5 for slip resistance test methods.

1.04 SUBMITTALS

A. Product Data: Written product information, which demonstrates materials to be used on the project comply with contract documents.

B. Shop Drawings: Showing tile layout and details of expansion joints in tile work and underlying construction.

C. Samples of each type, class and color of tile, not less than 12 inches square, on plywood backing, and grouted.
   1. Trim and accessories: Samples of actual units in selected color.
   2. Edge strips: 6-inch long samples.

D. Manufacturer's specifications, installation, and maintenance instructions for materials specified.

E. Certification: Submit Master Grade Certificates for each delivery of each tile type, signed by tile manufacturer and installer.

F. Test Reports: Submit independent testing agency’s certified test reports which demonstrate tile materials and installation products comply with project requirements.

G. Qualifications Documentation: Written confirmation that companies executing work in this section comply with experience requirements.

H. All submittals are to be in accordance with Section 01300 – Submittals.

1.05 QUALITY ASSURANCE

A. Material Source: Furnish each type, finish, and color of tile product and accessory materials from a single supplier.
B. Installer: A company with not less than 20 installations of tile work similar in size and complexity to the work of this project.

C. Provide tile of domestic manufacture, standard grade, conforming to TCA 137.1.

D. Furnish a "Master Grade Certificate" in the form acceptable in the above-referenced standard for each type of tile, signed by the manufacturer and the contractor, certifying the grade, type and quantity of tile.

E. Provide temperatures in tiled areas during installation and after completion as required by referenced installation standard or manufacturer's instructions, but not less than 50 degrees F

F. If necessary to use temporary heaters, vent units to exterior to protect tile work from carbon dioxide accumulation

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store tile products and setting materials in manufacturer's sealed packages.

B. Protect material from damage and store in dry location.

PART 2 PRODUCTS

2.01 MATERIALS - GENERAL

A. Ceramic Tile Standard: ANSI A137.1.

   1. Tile grade: "Standard Grade," unless noted otherwise.


C. Colors, Textures, and Patterns, Tile, Grout, and Other Products: Match colors indicated or as selected by the Owner from manufacturer's standards.

   1. Tile trim and accessories: Match color and finish of adjoining flat tile.

D. Color Blending: Factory-blend tile products which have a natural color range so products taken from one box will have the same range as products from a separate box.

E. Manufacturers:
1. Daltile
2. American Olean
3. Or approved equal.

2.02 CERAMIC TILE PRODUCTS:

A. Wall Tile: Ceramic, glazed porcelain body, cushion edge,
   1. Size: to match existing. All joints must align with existing.
   2. Thickness: ¾ inch.
   3. Face: Plain w/cushion edges.
   4. Finish: to match existing.
   5. Color: to match existing; to be approved by Architect, approved by SEPTA.

2.03 SETTING MATERIALS:

A. Portland Cement Mortar Installation: ASTM C150, Type I; white where required to match samples
   1. Setting bed reinforcing: Galvanized welded wire fabric, 2 inches by 2 inches, ASTM A 185; with W0.3 by W0.3, 0.0625 inch diameter, wire, ASTM A 82 except for minimum wire size.
   
B. Hydrated Lime: ASTM C206, Type S, or ASTM C207, Type S.
   
C. Water: Clear and without deleterious substances.
   
D. Sand: ASTM C144.

2.04 PIGMENTS:

A. Pure mineral pigments, resilient to alkalis, non-fading and weatherproof, colors selected by the Engineer.

2.05 METAL LATH:

A. 3.4 pounds per square yard expanded, self-furring, zinc-coated metal lathe with zinc-coated nails and galvanized wire anchorage.

2.06 CLEAVAGE MEMBRANE:
A. 4-mil polyethylene film, sealed at all edges and 1 inch sealed overlaps.

2.07 WATERPROOFING MEMBRANE:
A. Trowel applied membrane consisting of a liquid polymer and dry powder, job-mixed to form a plastic paste, applied in multiple layers with continuous glass fiber reinforcement forming a seamless waterproof membrane. Laticrete "Trowel Applied Waterproofing Membrane System", Laticrete International, or approved equal.

2.08 MORTAR AND GROUT:
B. Grout for Tile: Color to match existing and samples approved by the Architect. Manufactured by the following or approved equal:
   1. L & M Surco Mfg., Inc., South River, N.J.
   2. USM Corp., Upco Chemical Division, Cleveland, OH
   3. H.B. Fuller Company, Palatine, IL
C. Fungus and bacteria-inhibiting agents as standard with the grout manufacturer.

2.09 MISCELLANEOUS MATERIALS
A. Edge strips; fabricated from the following material with 1/8 inch wide exposed edge, and means for securing strip to substrate:
   1. Zinc alloy.
   2. Stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify with the installer that substrate areas where tile is to be installed have been prepared correctly, and that all backing materials have been installed. Correct unacceptable conditions before start of tile work.

3.02 PREPARATION:
A. Transmit submittals required by this Section.

B. Furnish products as indicated.

C. Ensure that substrates are in suitable condition to receive the work.

D. Factory Blending: Before start of installation verify that tile with an anticipated range of colors has been correctly blended to achieve a uniform color range from tile package to tile package.

3.03 INSTALLATION:

A. Comply with applicable requirements of ANSI A108.1 through A108.6 and recommendations of TCA "Handbook for Ceramic Tile Installation".

B. Comply with the manufacturer's instructions for the installation of each material.

C. Do not exceed the following deviations from level or plumb, or from elevations, locations, slopes and alignments shown:

   1. Joints: Plus or minus 1/32 inch joint width variation at any location; 1/16 inch in 3 feet for deviation from plumb and true, and for other variations in alignment of joints.

D. Lay out tile work using field tile and trim shapes. Center tile fields both directions in each space or on each wall area, and adjust to minimize tile cutting. Use uniform joint widths of 1/16 inch. Cut field tile, not trim shapes.

E. Extend tile work into recesses and under equipment and fixtures. Form a complete covering without interruptions. Terminate work neatly at obstructions, edges and corners without disruption of pattern or joint alignments.

F. Provide expansion joints.

G. Install waterproofing to comply with waterproofing manufacturer's instructions as necessary to result in a watertight installation.

H. Install tile under or behind equipment and fixtures.

I. Carefully cut, drill, and grind tile to fit around items projecting through tile surface, so that escutcheons or cover plates conceal cut edges.
J. Joint Patterns: Lay out tile according to patterns indicated on drawings, or if not shown, in a grid pattern with floor joints aligning with wall and trim joints. Install joints straight and of uniform width.

3.04 CLEANING AND PROTECTION

A. Clean tile surfaces after installation is complete.

B. Replace any broken, chipped, marred, or otherwise damaged tile before final acceptance.

C. Protection: Apply neutral protective cleaner to tile after installation if recommended by tile manufacturer. Overlay completed tile installation with kraft paper for protection from subsequent construction activities.

1. Do not allow any traffic on completed tile floors for minimum 7 days after completion.

2. Remove protection, rinse, and dry tile installations before final review and acceptance.

END OF SECTION
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SECTION 09670
SEAMLESS QUARTZ FLOORING

PART 1– GENERAL

1.01 DESCRIPTION
A. The work specified in this Section consists of all labor, materials, equipment and incidentals necessary to provide seamless quartz flooring with an aliphatic urethane protective coating for elevator cab floors.

1.02 RELATED SECTIONS
A. 14215 – Heavy Duty MRL Passenger

1.03 SUBMITTALS
A. Product Data: For each type of product. Include manufacturer's technical data, application instructions, and recommendations for each flooring component required.
B. Samples for Verification: For each flooring system required, 6 inches square, applied to a rigid backing by Installer for this Project.
C. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
D. Material Test Reports: For each flooring system, by a qualified testing agency.
E. Maintenance Data: For resinous flooring to include in maintenance manuals

1.04 QUALITY ASSURANCE
A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
B. Engage an installer who is certified in writing by quartz flooring manufacturer as qualified to apply quartz flooring systems indicated.
C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Apply full-thickness mockups on 96-inch- square floor area selected by Architect.
      a. Include 96-inch length of integral cove base with inside and outside corner.
   2. Simulate finished lighting conditions for Architect's review of mockups.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

5. A pre-installation conference shall be held between Applicator, General Contractor and the Owner to review and clarification of this specification, application procedure, quality control, inspection and acceptance criteria and production schedule.

1.05 DELIVERY, STORAGE, AND HANDLING
   A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

1.06 FIELD CONDITIONS
   A. Environmental Limitations: Comply with quartz flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting quartz flooring application.
   B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.
   C. Close spaces to traffic during resinous flooring application and for 24 hours after application unless manufacturer recommends a longer period.

1.07 WARRANTY
   A. Provide a written standard warranty from the manufacturer against defects of materials for a period of five (5) years, beginning with date of final acceptance of the project.

PART 2 – PRODUCTS

2.01 MANUFACTURER
   A. Basis of Design: Sika Corporation, 201 Polito Avenue, Lyndhurst, NJ 07071, Phone: (800) 933-7452, Fax: (201) 933-6225
   B. Or approved equal.

2.02 SEAMLESS QUARTZ FLOORING SYSTEM
   A. SikaFloor, High Performance Epoxy-Based seamless flooring system.
      1. System Materials:
40th Street Station  
ADA Improvements  

Addendum #3

Seamless Quartz Flooring 09670-3

a. Metal Lath: Tack weld 1/6" thick corrugated mill steel mesh to cab floor and cove base. Wipe down mesh as required with alcohol removing any slab or debris. Mesh shall be oil free type. 1/16" thick corrugated mill steel mesh tack welded to cab floor and cove base. Mesh shall be oil free type.

b. Mortar: Sikafloor 160 - epoxy Epo-Rok mortar system, 3/16" thickness.

c. Sikafloor 264 Thixo lite, 10-12 mils; with Sikafloor Broadcast Quartz blends

d. Sikafloor 216, 15 mils

e. Sikafloor 315, 4 mils

B. PRODUCT REQUIREMENTS

1. Mortar Sikafloor 160 epoxy Epo-Rok

   a. Percent Solids 100%
   b. VOC 5 g/L
   c. Bond Strength to Concrete ASTM D 4541 362.5 psi, substrates fails
   d. Water Absorption (2 hours boiling) ASTM C 413 .55%
   e. Compressive Strength, ASTM C 579 >10,000 psi
   f. Flexural Strength, ASTM D 580 37mpa
   g. Tensile Strength, ASTM D 307 2,176 psi
   h. Abrasion Resistance ASTM D 4060, CS 17 wheel, 1,000 g Load 110 mg

2. Thixotropic Epoxy grout coat Sikafloor 264 Thixo Lite

   a. Percent Solids 100 %
   b. VOC 50 g/L
   c. Compressive Strength, ASTM C 579 7,250 psi
   d. Flexural Strength, ASTM C 580 2,900 psi
   e. Pull-Off Strength, ASTM D 4541 >400 psi
   f. Shelf Line (unopened) 2 years
   g. Shore D Hardness, ASTM D2240 76 (7 days)

3. Epoxy Resin intermediate coat Sikafloor 216

   a. Percent Solids 100 %
   b. VOC 50 g/L
   c. Compressive Strength, ASTM C 579 7,250 psi
   d. Flexural Strength, ASTM C 580 2,900 psi
e. Pull-Off Strength, ASTM D 4541  400 psi
f. Shelf Life (unopened)  2 years

4. Aliphatic Polyurethane topcoat  Sikafloor 315
   a. VOC  100 g/L
   b. Tensile Strength, ASTM D2370  2,882 psi
   c. Abrasion Resistance, ASTM D4060 grams  0.01 – 0.02
   d. Coefficient of Friction, ASTM 2047  0.6-0.7
   e. Hardness, ASTM D 2369  2H-3H
   f. Slip Resistance, ASTM D2047  passes

PART 3– EXECUTION

3.01 EXAMINATION
   A. Examine substrates, areas and conditions, with Applicator present, for compliance with requirements for maximum moisture content, installation tolerances and other conditions affecting flooring performance.

      1. Verify that substrates and conditions are satisfactory for flooring installation and comply with requirements specified.

3.02 PREPARATION
   A. General

      1. New and existing concrete surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, and bituminous products.

      2. Moisture Testing: Perform tests recommended by manufacturer and as follows.

         a. Perform anhydrous calcium chloride test ASTM F 1869-98. Application will proceed only when the vapor/moisture emission rates from the slab is less than and not higher than 3 lbs/1,000 sf/24 hrs.

         b. Perform relative humidity test using is situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75% relative humidity level measurement.

      3. There shall be no visible moisture present on the surface at the time of application of the system. Compressed oil-free air and/or a light passing of a propane torch may be used to dry the substrate.

      4. Mechanical surface preparation
a. Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine (Blastrac or equal). All surface and embedded accumulations of paint, toppings hardened concrete layers, laitance, power trowel finishes and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a minimum profile of CSP 4-5 as described by the International Concrete Repair Institute.

b. Floor areas inaccessible to the mobile blast machines shall be mechanically abraded to the same degree of cleanliness, soundness and profile using diamond grinders, needle guns, bush hammers, or other suitable equipment.

c. Where the perimeter of the substrate to be coated is not adjacent to a wall or curb, a minimum 1/4 inch key cut shall be made to properly seat the system, providing a smooth transition between areas. The detail cut shall also apply to drain perimeters and expansion joint edges.

d. Cracks and joints (non-moving) greater than 1/8 inch wide are to be chiseled or chipped-out and repaired per manufacturer’s recommendations.

5. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and patch per manufactures recommendations.

3.03 APPLICATION

A. General

1. The system shall be applied in seven distinct steps as listed below:
   a. Substrate preparation
   b. Tack weld 1/16" thick corrugated mill steel mesh to cab floor and cove base.
   c. Trowel on Sikafloor 160 Epoxy Epo-Rok Mortar System, 3/16" thickness
   d. (1) one coat Sikafloor 264 Thixo Lite, 10-12 mils; with Sikafloor Broadcast Quartz Blends
   e. (1) one coat Sikafloor 216, 15 mils
   f. (1) one coat Sikafloor 315, 4 mils

2. Immediately prior to the application of any component of the system, the surface shall be dry and any remaining dust or loose particles shall be removed using a vacuum or clean, dry, oil-free compressed air.
3. The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results in accordance with the Manufacturer's recommendations.

4. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the Architect.

5. A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.

B. Mortar

1. Surface must be clean, sound and dry. Remove dust, laitance, grease, curing compounds, bond inhibiting impregnations, waxes and any other contaminants. All projections, rough spots, etc. should be dressed off to achieve a level surface prior to the application.

1. The product shall be applied using a screed and finished by hand troweling or power troweling. Provide thickness of 3/16”.

C. Grout Coat

1. Mixing ratio shall be 2:1 by volume. Premix each Component separately. Empty Component B (Hardener) in the correct mix ratio into Component A (Resin). Mix the combined components for at least 3 minutes using a low speed drill (300 - 450 rpm) and Exomixer or Jiffy type paddle suited to the volume of the mixing container to minimize entrapped air. Be careful not to introduce any air bubbles while mixing. Make sure the contents are completely mixed to avoid any weak or partially cured spots in the coating. During the mixing operation, scrape down the sides and bottom of the container with a flat or straight edge trowel at least once to ensure complete mixing. Do not mix more material than can be applied within the working time limits (i.e. Pot Life) at the actual field temperature.

2. Application: Grout coat shall be applied with a flat rubber squeegee or flat metal trowel tightly over a smooth surface. Back rolling shall be done with an 18 inch (455 mm) wide short nap, 3/8 inch (10 mm), solvent resistant roller cover. Back roll the Sikafloor 264 Thixo Lite only to level the squeegee applied material. Over-rolling and late back rolling may cause bubbling and leave roller marks. Do not apply by dipping roller into mixing container. Pour a bead of product in the form of a ribbon on the surface to be coated, then spread with squeegee and back roll.

D. Intermediate Coat

1. Mixing Ratio - 2 : 1 by volume. For bulk packaging, when not mixing full units, each component must be pre-mixed separately to ensure product uniformity.

2. Mixing for Field Pigmented: Premix each component separately. Add the appropriate Sikafloor Epoxy Color Additive to Component A.
at a rate of 1 quart (1L) per 4.5 mixed gallons (17 L) [(i.e. Components A+B)] for all colors except bright colors like White, Safety Yellow or Tile Red which require 2 quarts (2 L) per 4.5 mixed gallons (17 L) [(i.e. Components A+B)]. Confirm color section with SEPTA. Mix Component A and Sikafloor Epoxy Color Additive for 2 minutes or until a uniform color is achieved with a low speed drill (300 - 450 rpm) and Exomixer or Jiffy type paddle suited to the volume. Empty Component B (Hardener) in the correct mix ratio to Component A (Resin) and mix for additional 2 minutes. Be careful not to introduce any air bubbles while mixing. Make sure the contents are completely mixed to avoid any weak or partially cured spots in the coating. During the mixing operation, scrape down the sides and bottom of the container with a flat or straight edge trowel at least once to ensure complete mixing.

3. Application: Sikafloor 216 shall be applied with a 12 to 40 mil (0.30 - 1 mm) notched squeegee over a smooth surface and a flat squeegee over a rough decorative quartz or decorative flake surfaces. Back rolling is typically done with an 18 inch (455 mm) wide 3/8 inch (10 mm) short nap, solvent-resistant roller cover. Back roll the Sikafloor 216 only to level the squeegee applied material. Over-rolling and late back rolling may cause bubbling and leave roller marks.

E. Topcoat

1. Mixing: Empty the entire contents of the component a (isocyanate) into a clean bucket/container large enough to accommodate the mix size quantity. Using a jiffy blade and drill, add the component b (catalyst) to the component a (isocyanate) under agitation. Mix at low speed for 1 minute (300 - 450 rpm). Next, slowly add the wear additive aggregate to the material under agitation, mix for 2 minutes. Be careful not to introduce any air bubbles while mixing. Make sure the contents are completely mixed to avoid any weak or partially cured spots in the coating. During the mixing operation, scrape down the sides and bottom of the container with a flat or straight edge trowel at least once to ensure complete mixing.

2. Application using a Roller: Apply topcoat with an 18 inch (454 mm) wide short nap roller, 3/8-inch (10 mm), solvent-resistant roller cover at a thickness of 3 – 3.5 mils (0.075 mm). The floor area to be coated should be divided into sections that can be done completely in one application sequence. Sections should be divided at expansion joints or doorways when possible. The end of a section should be taped off to form a straight clean edge for an adjacent section. Pour the material in a roller tray and saturate the roller, remove the excess material by lightly rolling it in the tray. Apply 3 pairs of 8 - 10 foot long paths on to the floor. Spread the material with roller passes perpendicular to the originally applied paths. This material may be aggressively rolled to even out the application. It is
extremely important to apply the coating at a rate of 3 - 3.5 mils to achieve proper appearance, texture, and color stability. If material is applied too heavy, the coating may blister, if too thin, the coating will appear very flat in sheen. It is also very important to remix the material often with the roller in the tray to keep the aggregate from settling. Cross roll the entire area with straight uninterrupted passes across the entire width of the floor. This will reduce roller marks. If appearance is still not uniform after a few of these passes, repeat this procedure.

3. Application using a flat Squeegee: Pour a thin ribbon, approximately 6’’- 8’’ wide of Sikafloor 315 onto the floor surface. Using a flat squeegee spread the material at the manufacturers recommended rate. Avoid leaving puddles of the Sikafloor 315 on the floor surface. Using a 3/8’’ nap roller, back roll the material in the opposite direction that it was squeegee applied. Continue to back roll the material to achieve even coverage across the floor. The Sikafloor 315 can be rolled aggressively to remove any color shading. It is extremely important to apply this material at a rate of 3 – 3.5 mils (WFT). To finish, the Sikafloor 315 should be cross rolled; uninterrupted across the entire width of the floor. This will help reduce roller marks. It is important to remix the remaining material in the bucket before a fresh ribbon of material is poured onto the floor. This will ensure that the Wear Additive is evenly dispersed in the Sikafloor 315.

3.04 FIELD QUALITY CONTROL

A. Tests, Inspection

1. The following tests shall be conducted by the Applicator:
   a. Temperature: Air, substrate temperatures and, if applicable, dew point.
   b. Coverage Rates: Rates for all layers shall be monitored by checking quantity of material used against the area covered.

3.05 CLEANING AND PROTECTION

A. Cure flooring material in compliance with manufacturer’s directions, taking care to prevent their contamination during stages of application and prior to completion of the curing process.

B. Remove masking. Perform detail cleaning at floor termination, to leave cleanable surface for subsequent work of other sections.

END OF SECTION 09670
PART 1 GENERAL

1.01 DESCRIPTION
   A. Provide bird control strips where shown on Contract Drawings, including but not limited to signage, structural elements, rainwater downspouts, and other elements that are susceptible to birds. Bird control strips shall not be located in areas that are in reach of patrons.

1.02 RELATED SECTIONS
   A. Section 05120 – Structural Steel
   B. Section 05500 – Metal Fabrications
   C. Section 05501 - Custom Mild Steel Fabrications
   D. Section 07620 – Sheet Metal Flashing and Trim
   E. Section 07900 – Joint Sealers

1.03 SUBMITTALS
   A. Refer to Contract Terms and Provisions, Section 01300 - Submittals.
   B. Submit for manufacturer’s product data, installation guidelines, and maintenance information.
   C. Submit sample of each product specified.
   D. Submit for approval shop drawings of stainless bird control strips, including plans of Elevator Headhouse and Headhouse overhang, and all attachment details.

1.04 QUALITY ASSURANCE
   A. Refer to Section 01400 - Quality Requirements.
   B. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver,
handle, and store materials in accordance with manufacturer's instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and handle all materials to prevent damage by breaking, water or moisture and contamination by foreign materials.

B. Store materials on a clean, dry surface or platform, off ground, covered, separate from each other and protected from deterioration and the elements. Bear fully along all supported edges on level and true structural supports.

C. During freezing weather protect materials with tarpaulins or other suitable material.

D. Handle all materials in a manner which will prevent undue stress on component parts, sealants and structural members. Do not rack, torque, or cause load forces in an inappropriate manner.

PART 2 PRODUCTS

2.01 MATERIALS

A. Manufacturers:
   1. NIXALITE of America Inc., 1025 16th Avenue, East Moline, IL 61244-1424, Ph: 888-624-1189
   2. Bird Barrier America, Inc. 20925 Chico Street, Carson, CA 90746, Ph: 800-503-5444
   3. Or Engineer’s approved equal

B. Products:
   4. Model: “BirdSlide” UV Stabilized Polycarbonate, one-piece construction. Color to be custom color matched to match paint color at the various installation locations.

C. Features and Components:
   1. All clips and other hardware to be furnished by Manufacturer.
   2. End Caps for “BirdSlide” Model

PART 3 EXECUTION

3.01 INSTALLATION
A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections and discipline. Restore damaged finishes and test for proper operation. Clean and protect work from damage.

B. Drill and tap structural steel as required.

END OF SECTION
SECTION 10800
TOILET ACCESSORIES

PART 1  GENERAL

1.01  RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02  SECTION INCLUDES
A. Washroom accessories
B. Paper Towel Dispenser
C. Custodial accessories
D. Wall Mounted Mirrors
E. Soap Dispenser
F. Grab Bars
G. Toilet Paper Dispenser
H. Under sink piping covers

1.03  RELATED SECTIONS
A. Section 01300: Submittals
B. Section 01400: Quality Requirements
C. Section 04200: Unit Masonry
D. Section 16050: Basic Electrical Materials and Methods

1.04  SUBMITTALS
A. Product Data: For each type of product indicated. Include the following:
   1. Product Data Sheets
   2. Construction details and dimensions.
3. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.

4. Material and finish descriptions.

5. Features that will be included for Project.

6. Manufacturer's warranty.

B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated on Drawings.

2. Identify products using designations indicated on Drawings.

C. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

D. Sustainable Aspects:

1. Recycled Content:
   a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
   b. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
   c. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
   d. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

2. Local/Regional Materials:
   a. Sourcing location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
b. Manufacturing location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.

c. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.

d. Product Component(s) Value: Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

3. Recyclability Content: Provide documentation of manufacturer recycling program, if any.

1.05 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same articles in Part 2, provide products of same manufacturer unless otherwise approved by Engineer/Architect.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Sustainable Aspects:

1. Recycled Content Materials: Not less than 25% combined post-consumer and pre-consumer recycled content.

2. Recyclability Content Materials: Minimum recovery rate of 30% through recycling and reprocessing or reuse.

3. Local/Regional Materials: Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site. Product must be manufactured within 500 miles of project site. If a local source is not possible, contractor must provide documentation of said hardship. Documentation will not absolve contractor from meeting other requirements noted herein this Section or with Buy American Act.

1.06 COORDINATION
A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.07 WARRANTY

A. Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within specified warranty period.

B. Warranty Period: 1 year from date of Final Acceptance.

PART 2 PRODUCTS

2.01 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, 0.0312-inch (0.8-mm) minimum nominal thickness, unless otherwise indicated.

B. Brass: ASTM B 19 flat products; ASTM B 16 (ASTM B 16M), rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.

C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.0359-inch (0.9-mm) minimum nominal thickness.

D. Galvanized Steel Sheet: ASTM A 653/A 653M, with G60 (Z180) hot-dip zinc coating.


F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

G. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

2.02 TOILET ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or Engineer’s approved equal:

B. Basis-of-Design Product: The design for accessories is based on products indicated. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

1. Bradley Corporation
2. American Specialties, Inc.
3. TrueBro/IPS Corporation, TN
4. Or Engineer’s approved equal

C. Toilet Accessories Product Schedule:

1. Drawing schedule numbers:
   a. Mirror Unit: Bobrick; Model B290 Series
   b. Grab Bar: 36” long Bobrick; Model B-5806 Series
   c. Grab Bar: 18” long Bobrick; Model B-5806 Series
   d. Grab Bar: 42” long Bobrick; Model B-5806 Series
   e. Toilet Tissue Dispenser: Bobrick; B-4288
   f. Hand Dryer: Bobrick; B-7120 Series
   g. Soap Dispensers: Bobrick Model B21111
   h. Toilet Seat Cover Dispenser: Bobrick; Model B211
   i. Waste Receptacle; Bobrick; B-277
   j. Under sink piping cover: TrueBro; Model LAV GUARD® 2 E-Z series

2.03 GRAB BARS

A. Grab Bars - Basic Requirements: Fabricated to comply with ASTM F 446 and to withstand a 900 pound force, from ASTM A 554 stainless steel tubing, 0.050 inch, Type 304, 18-8 alloy; formed 1-1/2 inch radius return to wall at each end; each end heliarc-welded
to minimum 11 gage stainless steel circular flange; welds finished to match tube finish.

1. Peened finish.

2. Sizes and configurations: As indicated in Schedule

B. Grab Bar Concealed Mounting Flanges: Stainless steel, 3 inch diameter by 1/2 inch deep, with 0.0897 inch steel tenon plate for concealed attachment, using three set screws.

2.04 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to SEPTA’s representative.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install accessories according to manufacturers’ written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf (1112 N), when tested according to method in ASTM F 446.

3.02 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer’s written recommendations.

END OF SECTION
SECTION 14215

HEAVY-DUTY MACHINE ROOM LESS PASSENGER ELEVATORS

PART 1-GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Section Includes requirements for the fabrication, installation, and testing of two (2) heavy-duty machine room-less passenger elevators at the locations shown on the Contract Drawings.

1.02 RELATED SECTIONS

A. Division 1-General Requirements
B. Division 2-Site Construction
C. Division 3-Concrete
D. Division 4-Masonry
E. Division 5-Metals
F. Division 6-Wood and Plastics
G. Division 7-Thermal and Moisture Protection
H. Division 8-Doors and Windows
I. Division 9-Finishes
J. Division 10-Specilities
K. Division 12-Furnishings
L. Division 13-Special Construction
M. Division 15-Mechanical
N. Division 16-Electrical

1.03 REFERENCES

B. ASME A17.2 - American standard practice for the inspection of elevators, inspectors manual.
C. State of Pennsylvania-Title 34, Part XIV UCC, Chapter 405.

D. ANSI/ASTM A366 - Steel Sheet, Carbon, Cold-Rolled Commercial Quality.

E. ANSI/AWS D1.1 - Structural Welding Code, Steel.


H. ASTM A36 - Structural Steel.

I. ASTM A139 - Electric-Fusion (Arc) - Welded Steel Pipe (Sizes 4 inch and Over).


K. FS TT-P-641 - Primer Coating, Zinc Dust / Zinc Oxide (for galvanized surfaces).

L. National Fire Protection Association (NFPA - 70 and other related sections).

M. FS TT-P-645 - Primer, Paint, Zinc Chromate, Alkyd Type.

N. NEMA - National Electrical Manufacturers Association.

O. ADAAG – Americans with Disabilities Act Accessibility Guidelines.

P. Underwriters Laboratories, Incorporated (UL).

Q. American Federation of Bearing Manufactures Associations, AFBMA, Std. 9 & 11.

R. Any additional requirements imposed by agencies and/or codes having jurisdiction shall be incorporated into the elevators installation. Submit the required variance documentation to the State of Pennsylvania-Elevator Division. In case of a conflict between codes, regulations, or standards, the most stringent shall take precedence.

1.04 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer: Shall provide documents stating that their firm has successfully produced elevators for transit system applications for a minimum of ten (10) years. Acceptable manufacturers include, but are not limited to:
      a. Canton Elevator
b. Global Tardiff  
c. Hollister Whitney  
d. Minnesota Elevator  
e. Approved equivalent.

2. Installer: Manufacturer- and SEPTA-approved installer.


B. The contractor shall provide for three of the owner’s representatives to visit the factory where the elevator is being manufactured.

C. The contractor shall not ship the elevator without the approval of the owner after the conclusion of the factory visit.

1.05 SUBMITTALS

A. Section 01300 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings: Complete details of elevators construction and appurtenances including calculations as appropriate showing the following:

1. Dimensional Layout: Complete layout in plan and elevation, showing arrangement of equipment and pertinent details of the elevators, including the following:
   a. Equipment located in the control rooms.
   b. Locations of circuit breakers, switchboard panels, disconnect switches, and feeder extension points in machine rooms.
   c. Outlet locations in hoistways for connection of traveling cable for car lights, fire detectors, communication and control systems.
   d. Car, drive and motors, guide rails, buffers, and other components located in hoistway for each elevators.
   e. Rail bracket spacing and maximum horizontal forces and guide rails in accordance with Rule 200.5 of ASME A17.1.
   f. Reactions at points of support.
   g. Weight of principal parts.
   h. Loads on hoist beams
   i. Maximum loads imposed on racks requiring transfer to building structure.
   j. Top and bottom clearances and overrun travel of elevators.
   k. Provide name of manufacturer of control equipment, together with brochures, technical data, and the location of two (2) elevators applications/installations within thirty (30) miles of the project site.

2. Hoistway Entrances and Doors: Show methods of operation, details of construction, and fastenings to building structure.

3. Elevators Car: Construction details and location of equipment including car lighting, ventilation fans, communications systems, and fastenings.

4. Signaling and Operating System: Details of signaling and operating devices including electronic door detectors, detailing design of indication panels, and identifying graphics.
5. Schematic Wiring Diagram: Complete schematic and functional diagrams of electrical equipment and control wiring. Also provide installation drawings of electrical equipment and control wiring schematic diagrams of elevators system and sub-system indicating interfaces with the building structure.

6. Control Equipment Layouts: Layout, mechanical, and electrical details of elevators controller selectors, power door operators, door interlocks including door electrical protective devices, electrical contact, and communication system.

7. Buffers: Details of buffer, including stroke and certified maximum striking speed of car.

C. Product Data: Manufacturer’s catalog cuts, material specifications, warranty, drawings, installation and maintenance instructions, including electronic equipment to control and monitor elevators control functions, and other data pertinent to the components used in the elevators system.

D. Certification: Manufacturer’s certification that all elevators materials and components meet specified requirements. Provide certification stating that all stainless steel utilized on the project is type 316.

E. Samples:
   1. 305 mm square pieces of the following:
      a. Cladding with finish.
      b. Each type glazing.
      c. Flooring material
      d. Ceiling material.
   2. 305 mm lengths of the following:
      a. Glazing channel and fastening
      b. Stainless steel cab railings.

F. Operation and Maintenance Data:
   1. Owner/Service Manuals: Prior to installation, Contractor shall submit six (6) preliminary sets of operation and maintenance manuals for approval. After Owner approval and prior to the beginning of field testing, the Contractor shall provide four (4) sets of the approved manuals. The manuals and software shall include the following:
      a. Table of Contents
      b. Equipment and components, descriptive literature including a description of all safety devices.
      c. Performance data, model number.
      d. Installation instructions.
      e. Operating instructions.
      f. Maintenance and repair instructions including exploded views of all assemblies and a complete illustrated exploded view for identifying all system parts.
      g. Troubleshooting techniques.
h. Spare parts lists and current price list.

i. Lubrication instructions.

j. Detailed, record and as-built layout drawings.

k. Detailed, simplified, as-built, one line, wiring diagrams. Provide one (1) complete set per manual.

l. Field test reports.

m. Complete set of contract software including operating control software.

n. Twelve (12) keys for each new key-operated device that is provided.

o. Diagnostic tools configured to perform at all levels.

p. The contractor will provide certification, in writing and signed by an officer of the organization, that the owner of the elevators shall be provided with copies of any and all information, correspondence, bulletins, newsletters, manuals, techniques, procedures, drawings, sketches and any other documents related to maintenance, safety, operations, design changes, modifications, retrofits, etc., which relate to any part, component, equipment, system, subsystem or material and services applicable to the elevators provided. All operating, programming and control software and licensing keys as applicable to the PLC control system including an open-source, readable copy of the PLC ladder logic code designed for this installation.

q. All of the above referenced shall be provided as it pertains to the original installation and for a period of ten (10) years after final acceptance of the last elevators provided.

r. The elevators manufacturer shall provide the reference material within thirty (30) days of publication or internal distribution. The material, even if labeled PROPRIETARY, shall be delivered to SEPTA without prejudice or delay and at no additional cost.

s. The entire manual shall also be provided in a SEPTA approved electronic format on CD-ROM. Provide two (2) copies.

t. Control Room Prints: Provide complete set of lubrication charts, as-built" field wiring and straight line wiring diagrams showing all electrical circuits in the hoistway as well as the machine room. These diagrams shall be laminated and provided in a watertight stainless steel frame with Lucite cover. Locate in the control room as directed.

u. MSDS and product data sheets: Shall be submitted with an index listing each product, along with the application method of the product, approximate quantity of product per elevators, and the component the product is applied to or associated with.

G. Spare Parts List: No later than sixty (60) calendar days before completion of the installations, and prior to SEPTA’s acceptance, provide SEPTA designated representative with five (5) separately bound copies of a recommended spare parts list, include part number, description, quantities, sources and unit prices.

H. Spare Parts: The Contractor shall provide the following listed spare parts upon the completion of the elevator installation:
1. Four (4) replacement rollers for main guides
2. Four (4) replacement rollers for counterweight guides
3. Eight (8) hoistway door rollers
4. Four (4) car door rollers
5. Eight (8) hoistway door gibs
6. Four (4) car door gibs
7. Two (2) electronic door detector
8. One (1) set of replacement lights for each elevator cab
9. One (1) box of each type of fuses
10. Four (4) complete door interlock assemblies
11. One (1) door operator motor
12. Four (4) complete hall pushbutton assemblies
13. Four (4) complete car pushbutton assemblies

I. Interim Maintenance Program: Details of services to be performed and their scheduled frequency; are to be submitted no later than sixty (60) calendar days prior to completion of the installations and prior to SEPTA's acceptance of installation as specified in paragraph 1.06M.8. herein.

J. Maintenance Data Reports: After maintenance program is in effect, submit reports as specified in paragraph 1.06P. herein.

K. Qualifications:
   1. Qualifications for Elevator Subcontractor:

L. Submit welder’s certification as specified.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Product Requirements: Products storage and handling requirements in accordance with Division 1 requirements.

B. Deliver valid forms and installation instructions in manufacturer’s packaging.

C. Store off ground in ventilated and protected manner to prevent deterioration from moisture.

1.07 COORDINATION

A. Section 01041 – Project Coordination: Coordination and project conditions.

B. Coordinate this Section with other sections of work, requiring attachment of components to formwork.
   1. Installation and testing of the Elevators CCTV and Emergency Intercom System.
   2. Coordinate installation of sleeves, block outs, and items that are embedded in concrete or masonry for elevators equipment. Furnish
templates and installation instructions and deliver to Project site in time for installation.

3. Coordinate sequence of elevators installation with other work to avoid delaying the Work.

4. Coordinate locations and dimensions of other work relating to the elevators including pit ladders, sumps, and floor drains in pits; entrance subsills; and electrical service, electrical outlets, lights, and switches in pits and machine room.

1.08 PROJECT CONDITIONS

A. Protection: During installation and until all elevators systems are fully operational and accepted by SEPTA, make all necessary provisions to protect all elevators components from damage, deterioration, and adverse environmental conditions. Do not use or allow the use of the elevators for construction purposes such as hauling materials or worker transport during construction.

B. Coordination Requirements:
   1. Alterations: Contractor shall coordinate with SEPTA any alterations required accommodating the elevators.
   2. Floor Finish in Cab: Contractor shall install cab flooring material as specified.
   3. Lock and Key Requirements: Contractor shall coordinate with SEPTA.
   4. Pit Drainage: Contractor shall coordinate location of sump pits, pumps, pipes and related wiring with the elevators installer.
   5. Rigging Plan: Contractor shall supply a rigging plan that must be approved by SEPTA prior to the commencement of equipment installation.
   6. Safety Training: Contractor shall attend appropriate safety training programs provided by SEPTA at no extra cost.
   7. Methodology: The Contractor shall meet with SEPTA and provide a plan written method of rigging, demolition and elevator installation plans for SEPTA’s approval.
   8. Electrical: The Contractor shall coordinate all trades regarding the installation of CCTV, communications, smoke detectors, power and cab lighting requirements.

1.09 TEMPORARY AND PERMANENT ELECTRICAL POWER SERVICES:

A. For the elevators drive systems: 480 volts, 3 phase, 3 wire, 60 Hertz in a disconnect switch within sight of the controller.

B. For lighting and GFCI receptacles: 120 volts, 1 phase, 3 wire, 60 Hertz terminating at the elevator machine room.

C. Disconnect for cab lighting and oil cooler.
PART 2 PRODUCTS

2.01 MATERIAL

A. Except where product conformance to specific standards is indicated on the Contract Drawings and in ASME/ANSI A17.1, manufacturer’s standard materials and equipment may be used in elevators construction, subject to prior review and approval. Materials cited below are intended to establish the minimum standard of quality for comparable materials used by the manufacturer.

B. Structural Shapes, Plates, Sheets, and Tubing: ASTM A 36 Steel.

C. Sheet Steel: ASNI/ASTM A 446, Grade B.

D. Stainless Steel: AISI Type 316, with No. 4 finish. Refer to section 05500 for specific requirements.

E. Aluminum: ASTM B 211 or ASTM B 221, Alloy 6061, T6.

F. Transparent Glazing Panels: Type B laminated safety glass.

G. Sub Flooring: Slip-Resistant Metal Fabrication.
   1. To be installed in a single piece without joints inside elevator cabs as finished floor surface. Provide fabrication in shapes and sizes unique to each elevator cab as indicated on Drawings. Coordinate with elevator manufacturer and installer regarding scheduling installation.

   Type: Anti-slip floor plate of ASTM alloy 316 stainless steel.
   a. Thickness: 3/8”
   b. Surface Texture:
      1) Coefficient of Friction, Anti-Slip Surface: OSHA and ADA Compliant. Minimum 0.80 for Wet and Dry Surfaces.
      2) Resilient flooring systems shall be self-extinguishing, have 200 Deg. F. heat resistance, 11,700 PSI compressive strength, 2,200 PSI tensile strength, and 5,000 PSI flexural strength.

2. All perimeter edges of anti-slip floor plate shall be ground smooth and deburred for acceptance of cab base wall mullion structures. Coordinate with elevator cab manufacturer and elevator platform manufacturer for specific securing and bracing requirements to elevator platform and anti-slip floor plate.

H. Finished Flooring:
   1. Epoxy resin with vinyl chips flooring as specified in Section 09670 on a stainless steel substrate

I. Other Finishes: Provide protection for all metal parts, fittings, and accessories by painting or galvanizing, except for stainless steel or anodized aluminum.
2.02 QUALITY ASSURANCE

A. General:
   1. Provide parts built to standard tolerances, dimensions, and clearances so that similar machines and devices are completely interchangeable.
   2. On parts of equipment subject to wear and requiring occasional replacement, provide tamper proof key and seat, nut, screws, or other removable and replaceable type mechanical fasteners. Use of rivets or similar type fasteners requiring physical deformation during field positioning will not be permitted.
   3. All elevators shall have a ride quality of A95 raw 35 mill-g, peak to peak in the x, y and z axis during a full load run in the up direction.
   4. Controllers located in elevator machine room will be required to operate within a temperature range of -23° C through 40° C.
   5. The elevators shall be designed to comply with seismic zone 2 requirements of ASME A17.1.

B. Elevator System Requirements:
   1. Provide elevators complying with ASME A17.1, with rated loads, speeds, and other system requirements as follows:

<table>
<thead>
<tr>
<th></th>
<th>ELEVATOR #1-2</th>
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<tbody>
<tr>
<td>Capacity</td>
<td>2500lbs</td>
</tr>
<tr>
<td>Speed</td>
<td>150fpm</td>
</tr>
<tr>
<td>Travel</td>
<td>Per contract drawings</td>
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<td>Stops</td>
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<td>Type</td>
<td>MRL-Machine Room Less</td>
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<tr>
<td>Control Room</td>
<td>Adjacent</td>
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<tr>
<td>Control</td>
<td>PLC-Two Stop Collective</td>
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<tr>
<td>Platform</td>
<td>4’-10”wide by 7’-8” deep</td>
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<tr>
<td>Dimensions</td>
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<tr>
<td>Cab Inside Clear Dimensions</td>
<td>4’-6” wide by 6’-9” deep</td>
</tr>
<tr>
<td>Entrances</td>
<td>3’-0” wide by 7’-0” high</td>
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<td></td>
<td>316 No. 4 Stainless steel</td>
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<tr>
<td>Special Features</td>
<td>Custom Glass Car Enclosure</td>
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<tr>
<td></td>
<td>ADA compliance</td>
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<td></td>
<td>Glass Car &amp; Hoistway Doors</td>
</tr>
</tbody>
</table>
Elevations #1-2

Vandal Resistant Signal & Operating Fixtures
Car Traveling Lanterns
Type 316 stainless steel in #4 brushed finish
Emergency Power Operation

“Hands-free” ADA compliant telephone, VPP model T-1250E.

C. Rated loads exclusive of the complete car weight.

D. Two-way automatic maintaining type leveling device to stop the car at landing with car floor within .25" of the landing floor level, and to correct overtravel or undertravel and maintain the level during loading and unloading.

E. Accomplish opening and closing of hoistway doors without appreciable shock or jar.

F. Hours of Operation: The elevators shall be designed for twenty-four (24) hours per day, seven (7) days per week operating capability.
   1. Elevator components shall be designed based on the following applied duty cycle during operation:
      a. Three (3) Hours with 100% Rated Load
      b. Six (6) Hours with 50% Rated Load
      c. Fifteen (15) Hours with 25% Rated Load
      d. Maximum dwell time per landing in these calculations shall be no more than 10 seconds.

G. Environmental Operation Conditions: Elevators shall operate as specified while exposed to the following:
   1. From -32° C (-25° F) through 49° C (120° F) dry bulb temperature while exposed to sunlight, rain, snow, slush, sleet, salt, airborne dust, debris and corrosive elements, etc.
   2. During installation and until formal written acceptance by SEPTA’s designated representative, elevators may be subject to more extreme environmental conditions.
      a. Provide the necessary protection to prevent damage or deterioration to the elevators during this period.
      b. The elevators shall have a special winter operation. The elevators shall be designed to cycle (run from top floor to bottom floor) in a pre-prescribed time frame, in the event the outside temperature falls below a pre-established minimum value. The elevators contractor shall furnish and install the necessary timers and thermostat to
accommodate the desired function. SEPTA will establish the minimum temperature value.

H. Sound Level Criteria for Elevators and Associated Equipment:
   1. Steady-state noise level shall not exceed 55 dBA in public spaces when measured 36” from the source and within the cab when measured 60” above the floor.
   2. Transient noise level (including elevators door operation) shall not exceed 65 dBA in public spaces when measured 36” front of source, or 75 dBA when measured 36” from the elevators door or within the cab using the fast meter response.

I. Hoistway Movement: Elevators shall sustain load and operate with maximum ¼” lateral movement of hoistway structure.

J. Operational Control: Programmable logic controller (PLC) processor shall be field programmable and non-proprietary.
   1. Control functions governed are direction of travel, acceleration, speed, retardation, starting, and stopping.
   2. Provide for normal elevator operation during the hours of that the station is open for operation. At all other times the elevator is to be lowered to the lowest landing and placed out of service. The elevator is return to normal operation when the station is opened. This operation is to be automatic and accomplished through the elevator control system.

K. Control from Smoke Alarm: Include provisions for the controls to respond to a fire alarm in the elevator hoistway, landings and/or elevator machine room and to direct the elevators return to the approved main or alternate floor location.

L. Electrical Requirements: Electrical equipment for the elevators shall be designed, selected, and fabricated as specified herein and in the appropriate sections of the electrical specifications. All electrical runs are to be concealed as much as possible from public view.

M. Field Testing:
   1. General: After installation and before both acceptance testing and before the date approved for start of interim maintenance, inspect and test the elevators and related equipment to the Engineer’s and SEPTA’s designated representative’s satisfaction that operation of every part of equipment complies with applicable requirements of ASME A17.1 including sound level criteria specified. Elevators shall be inspected in accordance with procedures outlined in ASME A17.2.
      a. Provide test instruments, materials, other necessary facilities, and all labor required for field tests specified.
   2. Notification Requirements:
      a. Notify the SEPTA Project Manager and the Engineer a minimum of five (5) working days prior to each scheduled test.
b. Notify the Commonwealth of Pennsylvania Department of Licensing and Regulation, Division of Labor and Industry, the Department of Licenses and Inspections, and the Engineer and SEPTA’s designated representative, a minimum of fifteen (15) calendar days in advance of final field tests.

3. Full Load Run Test: Run elevators continuously a minimum of one (1) hour with full specified rated load, during which time car shall be stopped at top and bottom landings with a minimum standing period of 10 seconds at each landing.

4. Speed Test: Make tests before and after full load tests. Using a tachometer on guide rail, determine actual speed of car in both directions of travel, both with full-specified rated load and no load in car. Tolerances for determining if car speeds meet the specified requirements are as follows:
   a. Ascending Car Speed: Not more than 10 percent above or more than 10 percent below required speed.
   b. Descending Car Speed: Not more than 10 percent above or more than 10 percent below required speed.

5. Car Leveling Test: Determine accuracy of floor landing tests both before and after full load run tests. Test accuracy of landing at all floors with full load and no load in car, in both directions of travel. Insure that leveling accuracy is maintained at +/- ¼”.

6. Electrical Tests: Ensure elevators wiring system is free of short circuits and accidental grounds. Test ground resistance of elevators structure, equipment, and raceways for continuity. Using megohm-meter, determine that insulation resistance of each circuit is more than one (1) megohm or higher as required by the cable manufacturer. Insulation resistance for motors shall be determined under actual conditions after installation.

7. Temperature Rise Test Motors: Perform this test during full load run test. Start test only when all parts of equipment are within 40°F (5°C) of ambient temperature at time of starting test. Under these conditions, temperature rise of equipment shall to be more than 140°F (60°C) above ambient temperature.

8. Acceptance: Elevators acceptance will be based upon elevators meeting requirements of Contract Documents and upon evidence of passing specified field tests and inspections. Field testing will be after elevators are connected to permanent power.

9. Test Reports: Within five (5) days after completion of a test, submit a test report stating type of test, test requirements, failures, or problems, and name of certifying Engineer and Title. Safety device failure or defective equipment shall be identified, with description of cause and corrective action taken.

10. Certification for operational use shall be accomplished during field testing. The certifying inspector from the enforcing agency shall be present during such testing.
11. The Contractor shall provide the SEPTA Project Manager and the Engineer with a copy of the enforcing agency’s inspection findings within fifteen (15) days after performance of the test.
12. Failures for any reasons shall be identified with cause(s) and corrective action taken.
13. Retest Notification Requirements:
   a. The SEPTA Project Manager shall be notified ten (10) days prior to the scheduled retest.
14. The certificate of inspection for operational use will be issued to SEPTA by the enforcing inspection agency. The certificate shall be posted in the elevators control room.

N. Acceptance Testing
1. Upon completion of all of the field tests and after the operational certificates are issued by the Pennsylvania Department of Labor and Industry the Contractor shall run the elevators and all maintenance monitors for a period of thirty (30) calendar days. During this thirty (30) day time period, the elevators shall be fully functional and available for public use (other than shut-downs due to passenger caused events or necessary maintenance for a period of up to four (4) hours each). Failure to achieve this operation will result in the thirty (30) day period starting again.
2. The Contractor shall be on a 24-hour call basis during this thirty (30) day period to respond to any emergencies and breakdowns. The Contractor shall provide 24-hour emergency telephone number(s), name(s) of the person(s) and the firm that will be providing the maintenance and repair services during this period.
3. If any maintenance or repair to the elevators causes the elevators to be unavailable for public service for more than four (4) hours, the thirty (30) day Acceptance Testing period shall be restarted. After the successful completion of the thirty (30) day Acceptance Testing period, SEPTA will establish the date(s) of the beneficial use of the elevators and the start of the one (1) year Warranty and Maintenance program.
4. Acceptance Testing shall be completed consistent with the phasing requirements in the Contract Documents.

O. Warranty:
1. The elevators and associated equipment shall be free of defective material, imperfect work and faulty operation not due to ordinary wear and tear or improper use or care, for a period of one (1) year from successful completion of Acceptance Testing. Defective work shall be repaired or replaced at no additional cost to the Owner.
2. The warranty does not begin until all of the following requirements have been met.
   a. The Operations and Maintenance Manuals are accepted by SEPTA.
b. The required training has been completed to the satisfaction of SEPTA.
c. All field tests have been successfully completed.
d. The acceptance testing has been successfully completed.
e. The elevators are in service for passenger/public use.
f. The State and local jurisdictions have inspected the elevators and issued the respective certificates of Operation.
g. All spare parts have been delivered and received by SEPTA.

P. Maintenance Requirements:
1. The Contractor shall provide full maintenance service as required by the Maintenance Manual prior to SEPTA providing permanent maintenance. This maintenance work shall commence at final equipment acceptance for each elevators and shall be provided for a period of twelve (12) months of maintenance service during the warranty period, by fully trained elevators mechanics. Maintenance include preventive maintenance examinations every other week totaling a minimum of one (1) mechanic hour per elevator, per visit (exclusive of repairs and callbacks) for adjustment, greasing, oiling and parts replacement due to normal elevators usage. Provide unlimited regular time and twenty-four (24) hour emergency call back service, including travel time, at no additional cost. Response to regular time callbacks shall be within one (1) hour and for overtime callbacks within two (2) hours.
2. All maintenance activities performed in accordance with the procedures set forth in the approved maintenance manual. Each month, the maintenance contractor is to submit a written detailed breakdown of all activities occurring in the previous month. In addition, the reports are to be provided in an electronic format acceptable to SEPTA's needs.
3. Perform work without removing cars from service during peak traffic periods between the hours of 7:30 AM to 9:00 AM and 4:00 PM to 6:00 PM.
4. A complete and comprehensive clean down of the elevators installation and hoistways are required at the end of the maintenance and warranty period. The Contractor shall obtain, in advance, approval from SEPTA regarding the elevators shutdown time period required to accomplish this work.
5. The Contractor shall assume responsibility and costs for the first annual inspection/clean down that includes required testing. Clean down is it be successfully completed prior to the end of the maintenance period and approval is required of SEPTA project manager or appointed representative.
   a. Reporting: Detailed monthly records of tasks performed including names of individuals performing the tasks, date and time performed, and other pertinent data. Elevators Contractor is required to conform to the requirements of SEPTA's data base maintenance system.
Q. Elevators are not to be used in during the construction period for hoisting material or moving personnel.

2.03 ELEVATOR COMPONENTS

A. General
   1. Elevator shall be designed with provisions for thermal expansion and contraction of complete elevators assemblies and for any movement of the facility.

B. Bearings:
   1. Bearings shall be rated for an AFBMA L10 life as specified, under a fluctuating bearing load. All bearings shall have basic dynamic load ratings.

C. Fasteners
   1. Fasteners shall be compatible with materials being fastened. Fasteners shall be furnished with self-locking nuts or retaining rings (spring washers, toothed disks). Fasteners shall be equal to or of greater corrosion resistance than the most corrosion resistant metals being fastened.

D. Machine: AC gearless machine, with permanent magnet synchronous motor, direct current electro-mechanical disc brakes and integral traction drive sheave. Machine to be mounted to the car guide rail or support beam mounted at the top of the hoistway.

E. Elevator Drive System
   1. Non-Regenerative Variable Voltage Variable Frequency Drive: The drive shall be microprocessor and IGBT based using vector control algorithms. The algorithms shall incorporate a motor model to determine the electromagnetic state of the motor. The motor model shall also encompass a temperature compensation algorithm which is essential for speed accuracy.
   2. Velocity shall be controlled by a feedback loop to within +/- 2% of contract speed and speed shall be independently supervised.
   3. Position of floors in the building shall be learned during a slow speed setup run. Once learned, floor locations shall be stored in non-volatile memory. Power loss shall not require the floors to be re-learned. Stopping accuracy shall be +/- 5 mm or less. Re-leveling shall be automatic.
   4. Resistors shall be provided to absorb the power regenerated by the motor. They shall dissipate power only when the motor is regenerating. Control shall be by IGBT.
   5. Maximum total harmonic distortion shall not exceed IEEE Std. 519 to be measured at the elevator disconnect.
F. Suspension Means: If steel core ropes are supplied, a means to provide constant lubrication shall be provided. An alarm indicator shall be provided when the oil reservoir is at 25% of capacity.

G. Emergency Auxiliary Stop Switch: An enclosed stop switch, mounted in the overhead machine area and/or on the machine of each elevator in accordance with Rule 2.7 of the Code, shall prevent operation of elevator when switch is activated. Switch shall be of the type described in Rule 2.7 of the Code.

H. Counterweight:
   1. Counterweights shall consist of a steel frame welded or bolted together and necessary steel weight sections. These weight sections shall be held securely in place within the frame. A minimum of two (2)-tie rods shall pass through the holes in all weight sections. Submit paint finish of counterweights for approval. Paint color selection to be determined by the Architect.
      a. A required counterweight screen where no compensation is used.
      b. The bottom of the counterweight shall have a buffer striking plate and means to attach knock-off blocks during rope stretch.
      c. Idler Sheave: To be located directly above the counterweight frame and integral with counterweight frame. The sheave material shall be accurately machined of semi-steel of hardness BHN 220-250 or as per manufacturers' requirements.
      d. Roller guides shall be mounted on top and bottom of the counterweight frames to engage the guide rails. Counterweight guides shall be of the roller type; each guide shall consist of a set of three (3) large diameter polyurethane rollers equipped with sealed preloaded ball bearings. Each roller shall be supported by a pivoted rocker arm that shall automatically adjust itself to guide rail misalignment and prevent excessive lateral car movement. Provide galvanized covers over roller guide assemblies.

I. A PLC-based controller shall be provided, governing starting and stopping, as well as preventing, damage to the motor from overload or excessive current. It shall automatically cut off the motor current and bring the car to rest in the event any of the safety devices are activated. The controller cabinet shall be equipped with integral A/C climate controls to meet ASME A17.1 temperature/humidity requirements for PLC and related equipment. The controller shall be mounted in a NEMA 4X stainless steel vented cabinet within the machine room. The controller shall utilize solid state start control and the PLC Manufacturer is to be Allen Bradley, Schneider or approved equal.
   
   1. Two Stop Collective Operation: As defined by ASME A17.1 and shall be the pressure upon one or more car buttons shall send the car to the designated landings in the order in which the landings are reached by the car, irrespective of the sequence in which the buttons are pressed, provided the hoistway door interlock and car door switch circuits are
completed. During this operation, the car shall also answer calls from the landings, which are in the prevailing direction of travel. Landing call shall be canceled when answered.

a. Pressure upon a hall button at a floor above the car location shall cause the car to start up and answer any up calls as they are reached by the car irrespective of the sequence the buttons have been pressed. The car shall not stop at floors where down buttons only had been pressed. If no further car or up hall calls are registered, the car shall reverse its direction preference to response to car calls or down hall calls.

b. The car shall start down to answer calls below the car and shall not stop where only up calls are registered. When traveling up, the car shall reverse at the highest call and proceed to answer calls below it. When traveling down, the car shall reverse at the lowest call and answer calls above it.

2. PLC shall be equipped with an Ethernet port configured for network communication utilizing the following protocols:
   a. Allen Bradley Modbus over Ethernet
   b. Modbus TCP/IP over Ethernet

3. Control functions governed are direction of travel, acceleration, speed, retardation, starting, and stopping.

4. Provide for normal elevator operation during the hours of that the station is open for operation. At all other times, the elevator is to be lowered to the lowest landing and placed out of service. The elevator is to be returned to normal operation when the station is opened. This operation is to be automatic and accomplished through the elevator control system.

J. Hoistway Operating Devices: Terminal stopping devices shall be provided to slow down and stop the car automatically at the terminal landing and to automatically cut off the power and apply the brake, should the car travel beyond the terminal landing.

K. Car frame and Safety: The car safety shall be of integral design with car frame and shall be designed to stop the car should it attain excessive descending speed.

L. Governor: The car safety shall be operated at an integral centrifugal speed governor. The governor shall actuate a switch when excessive speeds occur, disconnecting power to the motor and applying the application of the safety.

M. Hoistway Operating Devices: Terminal stopping devices shall be provided to slow down and stop the car automatically at the terminal landing and to automatically cut off the power and apply the brake, should the car travel beyond the terminal landing.
N. Roller Guides: Roller guides shall be mounted on top and bottom of the car frame. Provide galvanized covers over roller guide assemblies.

2.04 HOISTWAY COMPONENTS

A. Car Frame: A suitable car frame shall be provided with adequate bracing to support the platform and car enclosure. The buffer striking plate on the underside of the car-frame platform assembly must fully compress the spring buffer mounted in the pit before the plunger reaches its lower limit of travel. Provide welded or bolted ASTM 123 galvanized steel channel uprights affixed to crosshead and plank channels with welded or bolted bracing members and gusset plates which will remove strain from car enclosure while not be viewable through the cab glazing.

B. Platform, Heavy Loading Type: The car platform shall be arranged to accommodate one-piece loads weighing up to 25% of the rated load, such as wheeled food carts, hand trucks, etc. The platform shall be type 316 stainless steel.

C. Spring Buffer: Helical coil spring type.

2.05 WIRING

A. Conduit and Wiring

1. Unless otherwise specified, all electrical conductors in the pits and hoistways, except traveling cable connections to the car shall be provided in rigid zinc-coated steel conduit with steel outlet boxes, except that a small amount of flexible conduit may be used where conduit is not subject to moisture or embedded in concrete. Terminal boxes pull boxes and other similar items shall be of approved construction, thoroughly reinforced, and in no case less than number 12 USSG. All electrical boxes exceeding 150 cubic inches shall be supported independently of the conduits. The rigid conduit shall conform to the specifications here in before specified. All raceway shall be threaded rigid steel conduit. Flexible heavy-duty service cord, type SO, may be used between fixed car wiring and switches on car doors for door reversal devices.

2. All conduit terminating in steel cabinets, junction boxes, wireways, switch boxes, outlet boxes and similar locations shall have approved insulation bushings. If the bushings are constructed completely of insulation material, a steel locknut shall be installed under the bushing. At ends of conduits not terminating in steel cabinets or boxes, the conductors shall be protected by terminal fittings having an insulated opening for the conductors. All conduits terminating in NEMA 4 boxes shall be backed up with flat rust resistant steel plates to fit the entire area where the conduit penetrated the box.

3. Conduit fittings and connections using set screws or indentations as a means of attachment are not permitted.
4. Connect motors and other components subject to movement or vibration, to the conduit systems with flexible conduit.

5. The Contractor shall furnish all materials and completely wire all parts of the electrical equipment of the elevators including electrical devices on hatch doors.

6. All solid state and electrical components located on top of the car enclosure or in the hoistway shall be installed within NEMA 4 enclosures.

7. The conduits shall be of such size that the wires or cables can be readily installed and replaced, if necessary. No conduit or raceway shall be less than 3/4 inch trade size, except that for small devices such as door switches, interlocks, etc., ½ inch conduit may be used. The total overall cross sectional area of the wires contained in any conduit shall not exceed 40 percent of the internal area of the conduit.

8. Conduits shall be neatly and systematically run. All exposed conduit and boxes shall be supported by approved and substantial straps, hangers or clamps to the structural steel, reinforced concrete, or other approved supports. Riser conduits in hoistway shall be supported at each floor level.

9. All interlock, hall button and limit switch branch wiring shall be enclosed in flexible steel conduit with covering of liquid tight Type "EF" with connectors having nylon insulated throat.

10. All screws used for terminal connections of all wiring (machine room, hoistway and pit) shall be provided with "star washers" of proper size and type.

B. Conductors:
1. No joints or splices shall be permitted in wiring except at outlets. Tap connectors may be used in wireways provided they meet all UL requirements.

2. All wiring shall test free from short circuits or grounds. Insulation resistance between individual external conductors and between conductors and ground shall be not less than one meg-ohm.

3. Provide all necessary conduit and wiring between the remote control room and hoistway.

C. Traveling Cables:
1. Provide 10 percent spares, but not less than 6 spare conductors in each traveling cable. Cable shall be provided with Fiber Optics as supplied by Draka Elevator Products and or Approved equal.

2. Provide separate traveling cables for car lighting and fan control circuits.

3. Provide an individual traveling cable for telephone in the elevator car. Cable shall extend from junction box in hoistway to telephone box in car.
   a. The communication travel cables shall include a separate coaxial cable shielded for the communications system
   b. Provide five (5) pair of shielded wires and two (2) RG-6 type coaxial cables
4. Provide traveling cable for car work lights.
5. Car junction boxes shall be provided on the top of the elevator cab.
6. All insulated wiring, control wiring and wiring in traveling cables shall be tag coded at their terminals in the motor room or controller location and hoistway junction box, elevator cab junction box, and push-button stations within the cab, and shall agree with the approved wiring diagrams.

D. Car and hall operating signal circuits shall not exceed 48 volts.

E. Training of personnel on installation of fiber optic cable and its interface shall be at cost to the Installer.

2.06 CAB ENCLOSURE

A. Car Top: Car top shall be of stretcher leveled, cabinet grade, and 12 gauge furniture sheet steel, reinforced to support 200 pounds on any one square foot area. An emergency exit shall be installed in the car top in conformance with the Code. Interior surface of car top shall be painted black.

B. Size and detail to withstand design stresses and provide for attachment and support of cladding, housing, ceiling, glass panels, and appurtenances. Paint all members after fabrication. Exterior of car glazing shall be easily accessible for cleaning.

C. Suspended Ceiling:
   1. ¾” marine grade plywood faced and edged in stainless steel and backed with plastic laminate.
   2. Lighting is to be vandal resistant LED downlight system arranged as indicated in the project drawings.

D. Interior Walls: Interior walls shall be in accordance with the following:
   1. Cab details are reflected on the project drawings.
   2. Walls: 9/16” clear laminated glass panels in 12 gauge formed stainless steel frames.
   3. Glass panels are to be swing design and equipped with the appropriate safety switches that prevent the operation of the elevators when a panel is open. Coordinate glazing requirements with glazing specifications.
   4. Provide heavy duty 11ga. piano hinge with 3/8” pin having outside of the knuckle set flush with the outside of each frame.
   5. Incorporate stainless steel angles and anchors.
   6. Coordinate locking device requirements with the Authority.
   8. Include one (1) set of solid stainless steel handrails that are 3/8” x 2” and mounted to removable stainless steel brackets.
9. Stainless steel cove base is to be 6” high and to include vents that are equipped with ½” x 2” slots.
10. Stationary returns, transoms and entrance columns are to be provided in stainless steel.
11. Car Doors: Car doors shall be stainless steel and glass, horizontal side opening sliding type with operator, Doors shall protect the full width and height of car entrance opening when in the fully closed position. Car door frame shall be integral with front wall of cab. Coordinate glazing requirements with glazing specifications.
12. All glass is to be provided with “Vandalshield” protection as specified in the applicable section of the project manual.
13. Coordinate the installation of CCTV equipment within the design of the elevators cab as the elevators contractor is responsible for the installation of the camera and wiring to the control room. Provide assistance to the responsible contractor for providing CCTV equipment.

E. Car Door Equipment:
1. Door Hangers: Door hangers for car and hoistway doors shall be of the two point suspension sheave type equipped with grease packed heavy duty precision ball bearings, eccentric up-thrust rollers, and oiler/cleaners. Track shall be of formed cold rolled steel or cold drawn steel with rounded track surface to receive sheaves. Track shall be mounted on an eccentric stud to provide for adjustment.

F. Appurtenances:
1. Exhaust Fan: NEMA 4X exhaust fan, mounted on the car top, shall be a two speed, squirrel cage, centrifugal blower type capable of exhausting at least 350/700 CFM and shall conform to the requirements of the Code. Provide sixty (60) minute backup battery power for fan.
2. Car lighting shall provide a minimum of 10-foot candles and shall be of the type shown on the Contract Drawings. Car lighting shall be provided with emergency battery backup upon failure or interruption of normal car lighting. Emergency lighting unit shall provide required lighting for a minimum of four (4) hours. Battery charger shall be capable of restoring battery to full charge within sixteen (16) hours after resumption of normal power. Provide an external means for testing battery, lamps, and alarm bell.

2.07 HOISTWAY ENTRANCES:

A. General:
1. Hoistway entrances shall be of the horizontal sliding type, side opening.
2. Materials and finished surfaces exposed to public view shall be 316 stainless steel and glass.
3. Exposed steel parts in the hoistway that are not provided in stainless steel shall be galvanized steel.

B. Hoistway Frames and Doors:

1. Stainless steel hoistway frames shall be sound deadened and provided with wide profile and operating fixture cutouts as shown on the Contract Drawings. Frames are to be welded flush design.

2. Stainless steel and glass hoistway doors shall be as shown on the Contract Drawings. Hoistway doors shall be reinforced and provided with keyways as required for operating mechanisms and door hangers. Provide glass doors as indicated. Coordinate glazing requirements with glazing specifications. Each door panel shall have laminated phenolic bottom guides that run in landing sill slots.

3. All glass is to be provided with “Vandalshield” protection as specified in the applicable section of the project manual.

4. Provide rubber bumpers at top and bottom of each door section to stop doors at their travel limit when opening doors.

5. Provide continuous weather seals at base of doors from inside, and across full length of both leaves.

6. Guides shall be replaceable without removing door panels.

7. Hoistway side of doors are to be provided in galvanized steel.

8. Provide die cast jamb markings (2 per entrance) mounted at 5'-0" and flush to the finish surface.

9. Hoistway door hangers and door operator shall be as specified herein.

C. Struts and Closer Support Angles: Hoistway entrances adjacent to non-load bearing walls shall have hanger housing and door closers supported by galvanized steel angles of that are a minimum that are 3" by 3" by ¼ thick. Angles shall be continuous between sill and building beams above and shall be bolted to the hanger support. For load bearing walls (masonry, concrete block), submit for Engineer's approval, Shop Drawings of the method to be used to support hanger housing and door closers on the wall.

D. Landing Sills and Guards: Landing sills shall conform to Rule 110.11a of the Code and shall be stainless steel with grooves for door guides machine planed for minimum clearance. Mount sills on galvanized steel support angles that are to be anchored to floor construction. Landing sills shall be guarded in accordance with the Code by landing sill guards of 14 gauge steel minimum 316 stainless steel or galvanized steel.
E. Hanger Supports and Cover Plates: Hanger supports shall be 3/16 inch thick steel bolted to strut angles and closer support angles. Hanger cover plates shall be of 14 gauge galvanized steel minimum and shall extend the full travel of the doors. Covers shall be made in sections for convenient access when servicing hangers. Hanger sections above door openings shall be removable from within elevators car.

F. Fascia Plate and Dust Cover: Fascia and dust covers shall be 14 gauge steel, reinforced as necessary to ensure a flat even surface throughout. Dust covers shall extend the full width of the elevators hoistway to hanger housings and sills above. Toe guard shall be fastened to the sill at the lowest landing. All exposed surfaces are to be galvanized steel or 316 stainless steel.

G. Interlocks and Contacts:

1. The doors at each hoistway entrance and cab entrance shall be equipped with approved door interlocks of the unit system type tested as required by the Code.

2. Interlock shall prevent operation of the car away from a landing until doors are locked in the closed position. Interlock shall prevent doors from opening at any landing from the corridor side unless car is at rest at that landing, or is in the leveling zone and stopping at that landing.

3. Door unlocking devices shall conform to the requirements of the Code and shall be provided to permit authorized persons to gain access to hoistway when car is away from landing.

4. Provide an electric contact mounted on the car that will prevent the car from moving away from landing unless car doors are closed.

H. Sight Guards: Stainless steel to match hoistway entrance finish.

2.08 SIGNAL DEVICES AND FIXTURES

A. General: Provide signal fixtures and control devices for elevators. Buttons and signals shall be tamper resistant of the illuminated type that light-up when activated and remain lit until call or other function has been fulfilled. All signal fixture and control device faceplates shall be of Type 316, 10 gauge stainless steel with AISI No. 4 finish and provided with weatherproof gaskets.

1. Car Operating Station:
   a. Provide one station in the front return of the elevators.
   b. Car operating station shall contain a numbered call button for each landing served, and buttons for DOOR-OPEN, DOOR-CLOSE and EMERGENCY STOP (key switch type). Buttons shall be tamper resistant stainless steel. EMERGENCY STOP keyswitch.
c. Station shall also have a service cabinet for keyed switches of the car light; exhaust fan, independent operation, GFI duplex outlet and jack for sound power intercom.

d. Engrave the car operating panel with the following:
   1) No Smoking. Minimum 1 inch high lettering
   2) In Case of Fire Do Not Use Elevators
   3) Elevators Number: Minimum 2 inch high lettering
   4) Elevators Capacity: Minimum 2 inch high lettering
   5) Firefighters Operating Instructions. 1/8 inch high lettering

e. Firefighter Control Cabinet shall have all operational controls per ASME A17.1-2007

f. Provide die cast raised markings lettering for the car buttons and car controls in compliance with the "Handicapped Requirements" of ANSI/ASME A17.1. Die cast plates are to be flush with faceplate surface.

g. Emergency Communication Device: Vandal-Proof Products Model T1250E/130A, or approved equal. This model is an electronics only, one button product that shall be mounted behind the elevators car operating panel.

h. Control Room Communication Device: Vandal-Proof Products Machine Room Intercom device.

2. Car Top Inspection Station:
   a. Provide a top-of-car operating device in compliance with the requirements of section 2.26 and 3.26 of the Code. The device shall have control switches for UP, DOWN, OPERATE/INSPECT and EMERGENCY STOP. The device shall also have an 110v ac outlet for extension cord.

3. Hall Stations: Riser of hall stations of the push-button, call acknowledging, stainless steel, tamper resistant type shall be recess mounted into the wall at all elevators landings. Highest landing shall have a single DOWN button. Lowest landing shall have a single UP button. Incorporate ADA compliant telephone with each hall station. Faceplate finish shall be #4 stainless steel.

4. Car Position Indicator: Car position indicator shall be tamper resistant of the illuminated-signal or digital-display type, complete with an adjustable electronic chime that shall sound when car is stopping or passing a floor served by the elevators. Car position indicator shall be mounted in the car operating station.

5. Car Traveling Lanterns:
   a. Tamper resistant car traveling lanterns mounted in the strike and return columns shall be equipped with illuminated UP and DOWN signal arrows, but provide single arrow where only one direction is possible. Provide units projecting from faceplate for ease of angular viewing. Match materials, finishes and mounting method with hall stations.
b. In conjunction with each car traveling lantern, provide an adjustable electronic chime signal to indicate that a car is arriving in response to a hall call and to indicate direction of car travel. Signal shall sound one for up direction of travel and twice for down direction.

6. Bell Alarm System: Bell alarm system for each elevators shall be properly located within building and audible outside hoistway when activated by the EMERGENCY STOP switch in the car control station.

7. All signal and operating devices are to be provided with rubber gaskets behind each faceplate. Fixtures exposed to the exterior elements are to be waterproof.

8. Firefighters' Service System: Firefighters' service system shall be provided in compliance with code requirements.

9. Provide sound powered maintenance intercom system to facilitate the inspection, maintenance and required testing of the elevators systems. System shall consist of the appropriate weatherproof jacks that are wired in parallel. Locate jacks on each cartop, car operating panel and control room. Provide two (2) sound powered telephone headset microphones with extension cords.

2.09 DOOR OPERATOR EQUIPMENT

A. Provide a ½ hp GAL MOVFR water resistant door operator with encoderless VVVF drive and the following features:


2. Hand-held keypad programming.

3. Adjustments can be stored in the keypad and downloaded to another operator.

4. Adjustable door obstruction reversal.

5. Optical cams with LED indicators.

6. Test switches for open, close, nudging and speed zone set up.

7. Universal inputs for open, close, and nudging.

8. Reversing switch to back up the door reversal device.

9. Designed for exterior applications.

B. Door Protection: Electronic Entrance Detector Screen: Provide TriTronics electronic door detector device, which projects an infrared curtain of light guarding the door opening. Arrange to reopen doors if one beam of the curtain is penetrated. Unit shall have transmitters and receivers spaced at a minimum distance to provide the maximum amount of protection within the
height of the doorway. Systems, which have the availability to turn Off or On individual zones within the curtain, will not be allowed.

C. No door operating equipment is to be viewable through the glass hoistway and car door panels.

PART 3 EXECUTION

3.01 EXAMINATION

A. Section 01300 - Administrative Requirements: Coordination and project conditions.

B. Verify lines, levels, and centers before proceeding with installations. Verify dimensions agree with Drawings.

3.02 ADJUSTING AND CLEANING

A. All equipment shall be adjusted prior to final testing and acceptance.

B. Restore or replace exposed work soiled or damaged during installation.

3.03 TRAINING

A. Duration: The Contractor shall prepare and conduct a maintenance training program on SEPTA premises consisting of two classes each of 20 hours, for a total duration of 40 class hours. Each of the two classes shall consist of up to 10 SEPTA maintenance mechanics.

B. Training Subjects: Submit for approval, within sixty (60) days of notice to proceed, instructions that shall include, as a minimum: up-to-date elevators operation principles; systematic maintenance operations; trouble shooting, repair techniques; interpreting diagrams, blueprints, schematics and maintenance directives. At the conclusion of the training, Contractor shall furnish to SEPTA, one complete set of lesson plans, classroom notes and all other materials used in presenting the course.

END OF SECTION
SECTION 16772

CCTV SYSTEM

PART 1  GENERAL

1.01  SUMMARY

A.  Section Includes:
   1. Closed Circuit Television (CCTV) System; complete, including all wiring, cables, raceways, terminal cabinets, pull boxes, outlet and mounting boxes, cameras, power supplies, mounting hardware, testing, and all other accessories and miscellaneous items required for a complete operating system even though each item is not specifically mentioned or described.
   2. Place SEPTA approved label on each camera to uniquely identify the camera.

B.  Related Sections
   1. All Division 1 Specification Sections
   2. Section 16050 - Basic Electrical Materials and Methods
   3. Section 16060 - Grounding and Bonding
   4. Section 16070 - Hangers and Supports
   5. Section 16075 - Electrical Identification
   6. Section 16123 – Building Wire and Cable
   7. Section 16130 – Raceways and Boxes
   8. Section 16715 – Communications Circuits
   9. Section 16950 - Testing

1.02  QUALITY ASSURANCE

A.  General:
   1. All equipment and software provided shall be standard components that are regularly manufactured and utilized in the manufacturer’s system.
   2. All systems and components shall have been thoroughly tested and proven in actual use.
   3. All systems and components shall be provided with the availability of technical support from the manufacturer during normal business hours at no charge.
   4. Confirm the compatibility of all new equipment being provided on this project.
   5. All systems and components shall be Listed by UL and FCC specifically for the required application. (Provide evidence of compliance upon request.)
B. Manufacturer’s Qualifications: Company with a minimum of ten (10) years experience in the manufacture and design of Video Surveillance Devices. Registered to ISO 9001 Quality Standard

C. Installer Qualifications: An experienced installer with a minimum of five (5) years experience in the installation of CCTV Systems of similar type, size, and scope; who is an authorized representative of the manufacturer for installation.

D. Design and operation of the system shall conform to the following referenced codes, regulations, and standards as applicable:

2. Underwriters Laboratory - UL 294, UL864, UL 1950, UL 1076 and UL 60950
3. Federal Communications Commission - Part 15
4. NEMA - Section 250 (Enclosures for Electrical Equipment)
5. International Organization for Standardization – ISO 9001
6. Interference-Causing Equipment Standards – ICES-003
8. All applicable Federal, State, and Local laws, regulations, and codes

1.03 SUBMITTALS

A. Submit to Engineer the following information in accordance with the requirements of section 01300 and General Conditions of Contract:

1. Product Data: Manufacturer’s data, user, and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.
2. Shop Drawings: Include system device locations on architectural floor plans; full schematic of system, including wiring information for all devices.

B. Provide complete submittals, which shall include schematic wiring drawings and specification sheets for all equipment. Partial submittals will not be accepted.

1.04 OPERATION AND MAINTENANCE DATA

A. Submit to Engineer the following operation and maintenance information in accordance with the requirements of section 01830 and General Conditions of Contract:
1. Instruction books and/or leaflets
2. Focus aid
3. Recommended renewal parts list
4. Maintenance requirements
5. Final as-built drawings
6. Complete Wiring diagrams
7. CD-ROM with manual, software, and tools

1.05 ACCEPTANCE OF SYSTEM

A. Total acceptance of the system will only be made after the required tests, complete record document package, and the instruction period have been provided.

1.06 GUARANTEE

A. The Contractor shall guarantee labor, materials, and equipment provided under this contract against system defects for a period of one (1) year after the date of final acceptance of this work by the Owner.

B. Provide manufacturer’s THREE-YEAR warranty for CCTV products, covering replacement and repair of defective equipment.

1.07 MAINTENANCE

A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.

B. Provide live factory-direct technical support minimum 8:00am to 8:00pm (EST/EDST) via telephone and email.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Temperature
   1. Equipment/Communication Room Equipment
      a. Hardware installed in Equipment/Communication Room shall be designed, fabricated, and environmentally tested to operate in the temperature range between -13 degrees F (Fahrenheit) and 122 degrees F (Fahrenheit) with a relative humidity range of 5 to 95 percent, non-condensing.

2. Interior Equipment
   a. Interior equipment to be installed within SEPTA subway stations shall be designed and certified by the manufacturer to operate in a range of between -13 degrees F (Fahrenheit) and 122 degrees F (Fahrenheit) with a relative humidity of 20 to 80 percent, non-condensing. The Contractor shall make clear in the technical proposal any additional heating or air conditioning that may be required.
3. Equipment Storage and Start-up  
   a. All Exterior and Equipment Room products shall be designed to avoid damage due to thermal shock during normal operation or start-up during low temperature conditions.
   b. All equipment shall be designed for dry storage in temperatures that range from -13 degrees F (Fahrenheit) to 145 degrees F (Fahrenheit).

B. Weather and Elements  
   1. All Interior, Exterior and Equipment Room equipment and any other potentially exposed units, shall be designed and tested to operate continuously and reliably in varying conditions of humidity, rain, salt, dust, cleaning detergents, water spray, roadway chemicals, exhaust emissions, and other contaminants found in the transportation areas. This means that appropriate rain/corrosion/tightness testing shall be conducted for all transit equipment. All Exterior components shall be designed and finished to resist adverse effects from solar radiation.

C. Electromagnetic and Electrostatic Susceptibility  
   1. System equipment shall not be adversely affected by radiated or conducted electromagnetic or electrostatic interference from other onboard or fixed site equipment or from normal usage on or near public transit areas. Certain tests for Electromagnetic Interference (EMI) and Electrostatic Discharge (ESD) susceptibility are required. These conditions shall include, but not be limited to fixed site, portable, and mobile radio interference, incidental (spurious) radiation, ignition noise, lighting fixture (static) interference, electrical power system transients, and electrostatic discharge (air or contact).
   2. The Contractor shall investigate all environmental factors that may affect equipment operations both before and after installation of the equipment, including shock and vibration. Environmental deficiencies uncovered during installation testing, on-line demonstration, or final tests may be cause for additional design adjustments and additional environmental testing by the Contractor. SEPTA shall retain the exclusive right to judge the environmental acceptability of the components before final acceptance.

D. Electrical Power  
   1. All components shall be certified via testing to operate with normal outputs when the input voltage varies as much as +/- 10 percent. Provide one (1) PELCO Power Supply (Model MCS 16-20SB) for individual camera testing. Where existing power supplies are present (power supply already installed by FOPP), Contractor shall use the existing power supply for testing purposes. Units shall be turned over to SEPTA upon work completion to be used as spares.

E. Shock and Vibration
1. All Interior, Exterior and Communication Room equipment, when in their fully assembled configuration, shall not be damaged, nor shall the operational performance be degraded, after subjection to vibration of 1G at 10 Hz to 500 Hz or shocks of 20G for 11 +/- 1 millisecond.

2. Vibration isolation for equipment housings shall be provided (if applicable) to protect electronic components within the cabinets from long term low frequency events resulting from continual train operations through the stations. Contractor shall coordinate with electronic equipment and cabinet Manufacturers to determine proper vibration isolation hardware to meet the manufacturer’s electronic equipment environmental test specifications.

1.09 Tests and Waivers

A. The Contractor may request a waiver of environmental testing for any component previously tested and certified. In such an event, fully certified technical test data shall be submitted to SEPTA with the waiver request. SEPTA shall retain the exclusive right to require representative environmental testing or to waive such testing after reviewing the Contractor’s waiver request.

B. The Contractor may request where applicable representative, and or sample testing to be provided. In such an event, fully certified technical test data shall be submitted to SEPTA with the representative or sample request. SEPTA shall retain the exclusive right to require testing or to waive such testing after reviewing the Contractor’s request.

C. All environmental testing in accordance with these specifications shall require written test procedures prepared by the Contractor and approved by SEPTA. All environmental test procedures shall be submitted for SEPTA review and approval before the testing.

D. All environmental tests shall be completed and the results submitted to SEPTA Project Manager for approval prior to installation of equipment at any SEPTA site or sites outlined in this Specification.

E. All environmental tests shall be conducted by an independent test facility that has been previously approved by SEPTA. The Contractor may use appropriate subcontracting to achieve environmental testing at the approved facility.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers (subject to compliance with requirements):
1. Cameras:
   a. Panasonic (no substitutions)

2. Power Supplies
   a. OTN ETS Switch for PoE

3. IP Switcher/Controller
   a. PELCO (no substitutions)

4. Copper Camera Cabling:
   a. Belden (Basis of Design)
   b. Approved Equal

B. Manufacturers submitted by the bidder as equals (or substitutions) to the basis of design shall comply with the requirements for substitutions in specification Section 16050, and the following:

1. The equipment to be supplied will be considered only if it meets all sections of the performance specification. Any deviations of system performance outlined in this specification will only be considered when the following requirements have been met:
   a. The supplier shall furnish evidence that the proposed or alternate system performance is equal or superior to the system operation stated in the specification.
   b. The supplier shall submit a point-by-point statement of compliance for all sections in this specification. The statement of compliance shall consist of a list of all paragraphs within these sections. Where the proposed system complies fully with the paragraph as written, placing the word "comply" opposite the paragraph number shall indicate such. Where the proposed system does not comply with the paragraph as written, and the supplier feels the proposed system will accomplish the intent of the paragraph, a full description of the function as well as a full narrative description of how its proposal will meet its intent shall be provided. Any submission that does not include a point by point statement of compliance as described herein shall be disqualified. Where a full description is not provided, it shall be assumed that the proposed system does not comply.
   c. The acceptability of any alternate proposed system shall be the sole decision of the Engineer.

2.02 SYSTEM DESCRIPTION

A. The intent of these specifications is to provide an extension of the existing station CCTV System with the following features and capabilities:
   1. Provide color cameras monitoring selected interior and exterior areas of the station (quantity and locations as indicated on the drawings). See specifications contained within for details.
   2. Provide all required components, accessories, hardware, cabling, terminations, etc. for a complete and operable system, in accordance
with the intent of the drawings and these specifications, whether enumerated herein or not.

2.03 FIXED CAMERAS

A. Provide Fixed cameras per the following:
   1. The manufacturer of the specified color dome camera shall provide optional hardware to allow the camera to be mounted per the camera schedule located on the drawings. Coordinate ceiling types and mounting hardware required.
   2. Lens selection based on “coverage” criteria in camera schedule.
   3. The basis of design for indoor & outdoor fixed position color cameras shall be The Panasonic WV-SFV631L Series.
   4. The basis of design for elevator cab cameras shall be The Panasonic WV-SW155 Series.
   5. Provided tinted/smoked bubble.

2.04 IP SWITCHER/CONTROLLER

A. Provide IP switcher controller per the following:
   1. PELCO Model CM6800-32X6 (Final IP Switcher/Controller selection shall be by SEPTA)

2.05 COPPER CABLE

A. Contractor shall utilize Cat. 6E cable for camera feeds.

2.06 POWER SUPPLIES

A. Utilize OTN ETS Switch (PoE) for camera power.

2.07 CABLES, WIRES, AND MISCELLANEOUS ACCESSORIES

A. Provide all necessary parts and accessories, including but not limited to adapters, connectors, plugs, transformers, switches, relays, lamps, splitters, media converters, and power supplies required to guarantee a complete and fully functional CCTV system.

B. Provide Rack equipment as required to accommodate new equipment which is to be installed in existing data racks.

C. Furnish and install a standard 19" wide x 84" high rack for the SEPTA C&S communications room for mounting miscellaneous electronic components. Rack shall include a grounding bar – rack shall be grounded to adjacent racks in existing C&S communications room.
2.08 CCTV DIGITAL VIDEO ENCODING/RECORDING SYSTEM

A. Basis-of-Design Product: Subject to compliance with requirements, provide Genetec Network Video Recorder, or approved equal.

B. The NSM unit shall record IP streams and/or analog video from video encoders or from analog cameras using multichannel encoders. It shall be able to record video streams from SEPTA at 30 images per second at 4CIF resolution at 30 day storage plus an additional 20% spare capacity. It shall play back up to 32 simultaneous streams and support up to 10 simultaneous queries.

C. It shall be possible to connect multiple multichannel encoders to a single NVR via the network record up to 48 analog video inputs. This shall allow for customization of the number of video inputs and storage for each recording site.

D. The NVR shall provide fault tolerance by employing RAID 6 disk management across up to 12 hard disk drives to eliminate downtime caused by a single hard disk drive failure. If a single hard disk drive fails, the RAID 6 implementation shall protect data from being lost. In addition, during an error condition or array rebuild, it shall be able to record up to 74 video streams, play back up to 32 simultaneous streams, and support up to 10 queries. It shall feature a hot drive swap that automatically configures the drives when installed.

E. The NVR shall use redundant power supplies to eliminate the power supply as a single point of failure.

F. The NVR shall be capable of continuous scheduled alarm/event and motion recording. Pre- and post-alarm recording shall also be available and shall be fully programmable on a per channel basis.

G. All video shall be digitally signed before being written to the hard disk drives. Video authentication shall be verified on the system before being played back with the video player.

H. The following diagnostics shall be reported to the viewing system: hard disk drive status, power supply status, fan status, air temperature, and video input stream status. Administration shall be able to view the status of individual components in real time to prevent failures before they occur.

I. Regardless of the number of cameras being furnished by the project onto a given NVR, all project supplied NVR shall be sized to accommodate 48 cameras worth of stored video for a period of 30 days based upon the following recording characteristics:
   1. Resolution – 4CIF (704x480)
2. Quality – Normal
3. Frame Rate per Camera – 30 fps.
4. Storage capacity – 24 hours per day for 30 days
5. Record Audio – Off

J. The Contractor shall be responsible for connecting any new project NVR to the existing CCTV System over the existing SEPTA security VLAN. Coordinate with SEPTA IT and SEPTA C&S to make the required connections from new NSMs to the existing VLAN.

K. The Contractor shall provide additional Genetec licensing, archive servers, ATI or Ethernet connected storage arrays to support the additional SEPTA cameras being installed under this project. This shall include all licensing, configuration of all software and hardware for the integration into the existing storage solution. The additional archive servers, along with the existing servers, shall be seamlessly integrated with the existing system. The Contractor shall supply all cabling, connectors and converters. SEPTA will provide all building power and cabling external to vendor supplied cabinets and equipment. The Contractor shall submit all equipment layouts and system design to SEPTA’s Project Manager for approval prior to procurement. The Contractor shall provide technical training and System Administrator training. Technical training shall consist of two 3 day sessions; each session shall be 8 hours long for a total of 24 hours and accommodate 10 students. The Contractor shall supply all training material and documentation in the form system drawings, system configuration and setting, user documentation, manufacturer OEM manuals and all custom configurations done by the contractor during installation. All training shall be onsite at a SEPTA-designated facility. All system software and hardware configuration options shall be documented and provided to SEPTA in the form of CAD files, excel spreadsheets, screen capture and word documents. The Contractor shall provide single line diagrams, system interconnection and wiring details in the form of CAD files. Documentation shall include all OEM documentation.

L. Only SEPTA’s existing CCTV Maintenance Contractor is permitted to work on the existing storage solution at 2nd Street and Wyoming Avenue.

M. The Contractor shall rack mount all equipment in server grade cabinets. All cabling shall be secured using industry standards for cable management. Patch cords shall be a minimum of CAT6 and have factory molded connectors. No crimp connections will be accepted.
PART 3 EXECUTION

3.01 GENERAL

A. Examine areas to receive devices and notify SEPTA Project Manager of adverse conditions affecting installation and/or subsequent operation prior to proceeding. Do not begin installation until unacceptable conditions are corrected.

B. Protect devices from damage during construction. Ensure operating temperature and humidity are within range accepted and recommended by manufacturer.

3.02 INSTALLATION

A. The contractor shall visit each fixed camera installation location identified on the drawings with SEPTA prior to ordering camera equipment for those locations and prior to performing any installation work, and shall perform the following with SEPTA witnessing and approving each planned installation:

1. Bring the three spare cameras, each equipped with the different lenses identified above.

2. Bring a suitable ladder or ladders, safety items, portable video monitor, portable power supply, and all other necessary cables, accessories, supplies and manpower.

3. Using a measuring tape and masking tape, locate the position of the equipment to be installed in the future that will be in the desired field of view. Typically this will be turnstiles, in some cases it will be one or more other objects such as rotogates and emergency exit gates, as identified by SEPTA.

4. Temporarily but steadily, position a camera equipped with the design proposed lens into the proposed installation location. The SEPTA representative shall view the image at ground level on the portable monitor.

5. The Contractor shall adjust the lens as necessary as directed by SEPTA such that SEPTA can determine if the view in that camera location will be acceptable.

6. The proposed camera location may need to be moved in any direction in order to obtain the desired view. The Contractor shall relocate the camera and adjust the lens to test the view in the new location.

7. If the design proposed lens does not provide the desired result, another spare camera with a different lens will be tested.

8. The Contractor will continue the test process with SEPTA until the optimal lens and location is determined for each camera installation location. Note that many of the cameras will have a similar view, i.e. of turnstiles. Once a camera distance, height and lens are determined, it will likely be the same for many camera locations. When parameters such as the camera height, distance and width of field of view vary,
additional testing will be required. For example this may occur where there is a different length turnstile array planned. Testing shall be conducted for as many locations as required by SEPTA.

9. A digital photo will be taken for each tested location and the lens and camera location information shall be documented.

10. The exact position for each camera location will be identified by careful measurements and will be documented along with a printed copy of the digital photo and all parameters, and signed by both the Contractor’s and SEPTA’s representative. The Contractor and SEPTA shall each receive a copy of the approved installation plan documentation.

11. The Contractor shall order the cameras with the approved lenses after the above testing has been conducted and approved by SEPTA. The cameras and lenses shall not be ordered until the above testing has been conducted to verify lens requirements.

B. Installation shall be performed by qualified service personnel.

C. All cabling shall be installed in conduit.

3.03 TESTS

A. Test snugness of mounting screws of all installed equipment. Test proper operation of all video system devices. Determine and report all problems to the manufacturer’s customer service department.

B. Demonstrate that video management system and devices function properly. Demonstrate camera’s functionality and video recording capabilities.

C. The Owner’s acceptance test will only be made after the above inspection, testing and adjusting of the complete CCTV System is performed, and the test report results are turned over to the Owner for evaluation. The Owner’s test will be the same as the above Contractor’s tests. The Contractor shall perform these tests in the presence of the Owner or the Owner’s representative.

3.04 FIELD ADJUSTMENTS

A. The Contractor shall repair or replace at his expense any defective devices, equipment or wiring and shall again perform any and all testing required to demonstrate that the system is in full compliance with the drawings and specifications.

B. Make proper adjustments to video system devices for correct operation. Make any adjustment of camera settings to comply with specific customer needs.
3.05 TRAINING

A. Upon the completion of all work and of all tests, the Contractor shall furnish the necessary skilled labor for providing operating and maintenance instructions of all systems and equipment for a minimum period of eight (8) hours of documented formalized instruction for the Owner, detailing the proper operation and maintenance of the installed system.

B. The instruction shall be presented in an organized and professional manner by a person factory trained in the operation and maintenance of the equipment and who is also thoroughly familiar with the installation.

3.06 ENVIRONMENTAL TEST PROCEDURES

A. The environmental requirements described herein shall be in effect for all components unless specifically excluded by other specification sheets of this procurement document.

B. All test procedures related to environmental testing for Temperature, Rain, Humidity, Salt Fog, Dust, Vibration and Shock which are prepared by the Contractor for SEPTA approval shall be formulated in accordance with the requirements of MIL-STD-810(E). Testing for electrostatic discharge (ESD) shall be formulated in accordance with IEC 61000-4. No exceptions shall be made to this requirement without prior written approval by SEPTA.

END OF SECTION
Platform Level Construction Floor Plan

Platform Level Demolition Floor Plan

- Remove existing floor finish
- Remove all existing plumbing fixtures, power to remain
- Remove all existing glass block
- Existing stair to remain
- Existing ventilation shaft: retain to cilog
- Existing portion of wall for new masonry construction
- Existing controller room: refer to A08
- Existing trash room: refer to A07
- Existing porter's room: refer to A06
- Existing electrical room: refer to A05
- Existing communications room: refer to A04

- Existing stair to remain
- Existing ventilation shaft: retain to cilog
- Existing portion of wall for new masonry construction
- Existing controller room: refer to A08
- Existing trash room: refer to A07
- Existing porter's room: refer to A06
- Existing electrical room: refer to A05
- Existing communications room: refer to A04

Platform Level Demolition Floor Plan

- Remove existing floor finish
- Remove all existing plumbing fixtures, power to remain
- Remove all existing glass block
- Existing stair to remain
- Existing ventilation shaft: retain to cilog
- Existing portion of wall for new masonry construction
- Existing controller room: refer to A08
- Existing trash room: refer to A07
- Existing porter's room: refer to A06
- Existing electrical room: refer to A05
- Existing communications room: refer to A04

Platform Level Construction Floor Plan

- Remove existing floor finish
- Remove all existing plumbing fixtures, power to remain
- Remove all existing glass block
- Existing stair to remain
- Existing ventilation shaft: retain to cilog
- Existing portion of wall for new masonry construction
- Existing controller room: refer to A08
- Existing trash room: refer to A07
- Existing porter's room: refer to A06
- Existing electrical room: refer to A05
- Existing communications room: refer to A04

**Notes and Tactile Replacement Phasing**

- Note: Emergency egress gates must remain operational at all times
- During construction:
  - Northeast and southwest corners
  - Northwest and southeast corners
- Station phasing summary:
  - Phase 1
    - Remove existing partition
    - Remove existing ventilation shaft:
    - Retain to cilog
    - Remove all existing plumbing fixtures
    - Remove all existing glass block
    - Existing stair to remain
    - Existing controller room: refer to A08
    - Existing trash room: refer to A07
    - Existing porter's room: refer to A06
    - Existing electrical room: refer to A05
    - Existing communications room: refer to A04
  - Phase 2
    - Remove existing floor finish
    - Remove all existing plumbing fixtures
    - Remove all existing glass block
    - Existing stair to remain
    - Existing ventilation shaft: retain to cilog
    - Existing portion of wall for new masonry construction
    - Existing controller room: refer to A08
    - Existing trash room: refer to A07
    - Existing porter's room: refer to A06
    - Existing electrical room: refer to A05
    - Existing communications room: refer to A04

- All work related to demolition, procurement and installation of the tactile warning tiles is by SEPTA.
- Existing fixtures shall be removed in accordance with the above phasing notes and remain in new finish until all work is complete.
- Existing curb line above and below the stair shall be retained to cilog.
- Emergency egress gates must remain operational at all times.
- Temporary construction barricade; refer to A43 for detail.
- Existing trash room to remain.
- Existing porter's room to remain.
- Existing communications room to remain.
- Existing utility sink to be replaced with new.
- Existing stair to remain.
- Existing ventilation shaft; refer to A43 for detail.
- Existing curb line above.
- Remove existing floor finish.
- Remove all existing plumbing fixtures.
- Remove all existing glass block.
- Existing stair to remain.
- Existing controller room: refer to A08.
- Existing trash room: refer to A07.
- Existing porter's room: refer to A06.
- Existing electrical room: refer to A05.
- Existing communications room: refer to A04.

- All work shall be carried out during shifts as and when determined.

**Scale:** 1" = 20'-0"

SIDE ELEVATION OF EACH HEAD HOUSE STRUCTURE ARE INCLUDED IN ARTIST'S SCOPE. THE ARTIST ELECT TO DEVIATE FROM THE QUANTITY AND SIZE AS THEY DEEM NECESSARY AS ELIGIBLE FOR ART ARE SUBJECT TO ARTIST INPUT AS THE ARTIST MAY INTEGRATION OF ARTWORK. THE SIZE AND QUANTITY OF PANELS INDICATED IN THE DRAWING ARE ESTIMATED BY THE GC, AND THE ARTIST SHALL PROVIDE THE ACTUAL SIZE AND QUANTITY OF PANELS TO BE PROVIDED.

THE ARTIST SHALL PROVIDE THE ACTUAL SIZE AND QUANTITY OF PANELS TO BE PROVIDED TO THE CONTRACTOR FOR THE FABRICATION AND INSTALLATION OF THE STAINLESS STEEL BAR FRAMES. THE CONTRACTOR SHALL PROVIDE A UNIT COST FOR THE GRILLES AND BAR FRAME TO BE FABRICATED AND DELIVERED TO ARTIST FOR ARTIST'S SCOPE.

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DEMOATION SECTION DETAIL AT REPLACEMENT WARNING TILE

SECTION DETAIL AT REPLACEMENT WARNING TILE

DETECTABLE WARNING TILE TO REPLACE EXISTING TACTILE WARNING TILES

MAINTAIN EXISTING EXPANSION JOINTS

EXISTING PLATFORM EDGE CAP TO REMAIN

EXISTING FLOOR TILE TO REMAIN

REMOVAL NEEDED AND PREP SURFACE UPON REMOVAL OF EXISTING TACTILE WARNING TILES IN ACCORDANCE WITH SPEC SECTION 06602

HEAVY DUTY ElASTOMERIC POLYURETHANE ADHESIVE

EXISTING CONC. PLATFORM STRUCTURE TO REMAIN

REMOVE EXISTING NON-COMPLIANT TILE, TYP.

EXISTING FLOOR TILE TO REMAIN

STAINLESS STEEL PIN BANG RIVETS; MIN. 15 EA. TILE

EXISTING PLATFORM EDGE CAP TO REMAIN

EXISTING CONC. PLATFORM STRUCTURE TO REMAIN

TYPICAL COVE BASE DETAIL

12" SCALD = 1'-0"

ENLARGED PLAN - DETECTABLE WARNING TILE

PLAN DETAIL - TACTILE DOME

TACTILE DOME DETAIL

DETECTABLE WARNING TILE TO REPLACE EXISTING TACTILE WARNING TILES

MAINTAIN EXISTING EXPANSION JOINTS
The conditions illustrated on this sheet constitute legal standards for handicapped accessibility. They are not intended to depict actual architectural conditions for construction in the course of this work. See enclosed architectural drawings for actual extent of work. Not all conditions shown here necessarily occur in this project.

Contractor to inform architect when due to field conditions, etc. Actual construction will not conform to these standards.

Accessibility Details & Mounting Height Schedule
### Light Fixture Schedule

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Manufacturer</th>
<th>Catalog #</th>
<th>Lamp Type</th>
<th>Mounting</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Round Cylinder Downlight</td>
<td>Lightolier</td>
<td>C7L-35-C-X-40K-M-CCD-U-VB</td>
<td>LED</td>
<td>Surface</td>
<td>Color per architect, cable mounted with 1&quot; cable length</td>
</tr>
<tr>
<td>C</td>
<td>Recessed Vandal Resistant LED Downlight</td>
<td>Kenall</td>
<td>HADL6L2-30L40K-DV-DCFW-T</td>
<td>LED</td>
<td>Recessed</td>
<td>Finish: 9' A.F.F. (Surface mount if lower ceiling)</td>
</tr>
<tr>
<td>D</td>
<td>4' Vandalproof Corner Mount Fixture</td>
<td>Kenall</td>
<td>HASEC114-3-32-RS-1-UNV-5F-2H-6</td>
<td></td>
<td>Surface</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>4' Enclosed Fluorescent Lightolier</td>
<td>Lightolier</td>
<td>ST4WA232-2-F32T8-Lower Ceiling</td>
<td>F32T8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Self Illuminated Exit Sign</td>
<td>Evenlite</td>
<td>SLV-20-R</td>
<td>LED</td>
<td>Surface/Ceiling (no wiring required)</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Battery Pack W/2 Attached Heads</td>
<td>Lightolier</td>
<td>ES-2-100L-2-CH50-SL-2-DL</td>
<td>Hal</td>
<td>Surface/Wall</td>
<td></td>
</tr>
</tbody>
</table>

### Electrical Panel Details

**Panel Designation:**
- **Type:** Branch Power
- **Location:** Main Elect. RM.
- **Address:** 1234 Market St, 13th Fl, Philadelphia, PA 19107
- **Number of Poles:** 24
- **Voltage:** 120/208 V, 3-Phase, 4-Wire
- **Main Bus Rating:** 225 A
- **Panel Mounting:** Surface

### Panel Load Details

<table>
<thead>
<tr>
<th>Circuit No.</th>
<th>Description</th>
<th>Manufacturer</th>
<th>Catalog #</th>
<th>Lamp Type</th>
<th>Mounting</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2EB</td>
<td>Elevator Pit Sump Pump</td>
<td>Lightolier</td>
<td>20/1</td>
<td></td>
<td>Surface</td>
<td></td>
</tr>
<tr>
<td>P2WB</td>
<td>Elevator Hoistway Receptacles</td>
<td>Lightolier</td>
<td>20/1</td>
<td></td>
<td>Surface</td>
<td></td>
</tr>
<tr>
<td>P2WB</td>
<td>Elevator Cab Lighting</td>
<td>Lightolier</td>
<td>20/1</td>
<td></td>
<td>Surface</td>
<td></td>
</tr>
<tr>
<td>P2WB</td>
<td>VMS Sign</td>
<td>Lightolier</td>
<td>20/1</td>
<td></td>
<td>Surface</td>
<td></td>
</tr>
<tr>
<td>P2WB</td>
<td>EMR. Receptacles</td>
<td>Lightolier</td>
<td>20/1</td>
<td></td>
<td>Surface</td>
<td></td>
</tr>
<tr>
<td>P2WB</td>
<td>Canopy Lighting</td>
<td>Lightolier</td>
<td>20/1</td>
<td></td>
<td>Surface</td>
<td></td>
</tr>
<tr>
<td>P2WB</td>
<td>Air Conditioner ACU-1</td>
<td>Lightolier</td>
<td>15/2</td>
<td></td>
<td>Surface</td>
<td></td>
</tr>
<tr>
<td>P2WB</td>
<td>Air Conditioner ACU-2</td>
<td>Lightolier</td>
<td>15/2</td>
<td></td>
<td>Surface</td>
<td></td>
</tr>
<tr>
<td>P2WB</td>
<td>Condensing Unit CU-1</td>
<td>Lightolier</td>
<td>20/2</td>
<td></td>
<td>Surface</td>
<td></td>
</tr>
<tr>
<td>P2WB</td>
<td>Condensing Unit CU-2</td>
<td>Lightolier</td>
<td>20/2</td>
<td></td>
<td>Surface</td>
<td></td>
</tr>
<tr>
<td>P2WB</td>
<td>Fan SF-1</td>
<td>Lightolier</td>
<td>15/1</td>
<td></td>
<td>Surface</td>
<td></td>
</tr>
<tr>
<td>P2WB</td>
<td>Unit Heater</td>
<td>Lightolier</td>
<td>20/2</td>
<td></td>
<td>Surface</td>
<td></td>
</tr>
<tr>
<td>P2WB</td>
<td>Unit Heater</td>
<td>Lightolier</td>
<td>20/2</td>
<td></td>
<td>Surface</td>
<td></td>
</tr>
<tr>
<td>P2WB</td>
<td>Battery Pack W/2 Attached Heads</td>
<td>Lightolier</td>
<td>ES-2-100L-2-CH50-SD2-DL-2</td>
<td>Hal</td>
<td>Surface/Wall</td>
<td></td>
</tr>
</tbody>
</table>

### Electrical Panel Load Calculation

- **Total Panel Connected Load:**
  - ΦA: 12.45 X Solid Neutral Bus
  - ΦB: 13.95 X Equipment Ground Bus
  - ΦC: 13.13 In Integral SPD
  - Total: 39.53 KVA

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**Notice:** This document contains information that is proprietary and confidential. Unauthorized reproduction or distribution of this document is strictly prohibited without prior written consent.
**GENERAL NOTES:**
1. ALL WORK TO CONFORM TO THE FOLLOWING:
   - AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) Z100-2011 (ELEVATOR AND ESCALATOR MANUFACTURERS’ CODE OF PRACTICE),
   - AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) CODE, TITLE 34, PA CODE CHAPTER 405, AS APPLICABLE.
   - CODE, TITLE 34, PA CODE, 2009 EDITION.
   - NATIONAL ELECTRICAL CODE (NEC) 2008.
2. TO BE DICTATED BY THE ELEVATOR CONTRACTOR BASED ON THEIR SPECIFIC EQUIPMENT REQUIREMENTS.
3. CONTRACTOR TO LOCATE AND INSTALL ALL DISCONNECTS AND CIRCUIT BREAKERS IN ACCORDANCE WITH THE LOCAL AUTHORITY HAVING JURISDICTION.
4. GENERAL CONTRACTOR TO LOCATE AND INSTALL ALL MASONRY, CARPENTRY AND BATING WORK.
5. ADEQUATE SUPPORT FOR GUIDE RAIL BRACKETS EXTEND FROM PIT FLOOR TO TOP OF HOISTWAY. SEE MAXIMUM RAIL BRACKET DEFLECTION.
6. ELEVATOR HOISTWAYS THAT ARE REQUIRED BY THE BUILDING CODE, MEETING WITH SEPTA, ELECTRICAL CONTRACTOR, GENERAL CONTRACTOR, CHIEF ENGINEER TO DISCUSS.
7. TO ENSURE PROPER EQUIPMENT OPERATION, THE OVERHEAD MACHINERY SPACE (INCLUDING FINISH PAINTING) ALL AREAS WHERE WALLS/FLOORS ARE REQUIRED.
8. GENERAL CONTRACTOR SHALL PROVIDE AND INSTALL A LIGHT FIXTURE(S) WITH PROTECTIVE COVER(S). ELEVATOR CONTRACTOR SHALL SUPPLY AND INSTALL LIGHTING FIXTURES IN THE ACCESS LANDING.
9. GENERAL CONTRACTOR SHALL PROVIDE AND INSTALL AND SUPPLY AND INSTALL LIGHT FIXTURES IN THE ACCESS LANDING.
10. ENTRANCE WALLS ARE TO BE LEFT OPEN UNTIL ELEVATOR INSTALLATION OF GUIDE RAIL BRACKETS.
11. ANY ADDITIONAL ELECTRICAL POWER DEVICES, SUCH AS INTERUPTED SINGLE OUTLET WITHIN PROXIMITY TO THE SUMP PUMP AND SUPPLIED BY THE GENERAL CONTRACTOR.

**CONTROLLER ROOM NOTES:**
1. WITHIN ELEVATOR ROOM, DUMP AND ELEVATOR CONTROL ROOM AND MECHANICAL ROOM CONTROL ROOM.
2. ALL SUPPLIES, CONDUIT AND WIRING TO BE PERMITTED TO ACCOMMODATE THE INSTALLATION OF THE ACCESS LANDING.
3. ALL ELECTRICAL EQUIPMENT AND ELECTRICAL HARDWARE TO BE PROVIDED BY THE GENERAL CONTRACTOR.
4. CONTRACTOR TO SUPPLY AND INSTALL LIGHTING FIXTURE(S) WITH PROTECTIVE COVER(S). ELEVATOR CONTRACTOR TO SUPPLY AND INSTALL LIGHTING FIXTURE(S) WITH PROTECTIVE COVER(S).
5. THE BUILDING CODE, MEETING WITH THE ELECTRICAL CONTRACTOR, GENERAL CONTRACTOR, CHIEF ENGINEER TO DISCUSS.
6. ADEQUATE ACCESS TO THE BUILDING/FACILITY, PROPER LIGHTING IN FACILITY.

**ELEVATOR CAB NOTES:**
1. CONTRACTOR TO LOCATE AND INSTALL ALL HOISTING AND CONVEYING MACHINERY.
2. CONTRACTOR TO LOCATE AND INSTALL ALL ELECTRICAL MACHINERY.
3. ELECTRICAL MACHINERY SUPPLIED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS INDICATED.
4. ELECTRICAL MACHINERY SUPPLIED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS INDICATED.
5. ELECTRICAL MACHINERY SUPPLIED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS INDICATED.
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11. ELECTRICAL MACHINERY SUPPLIED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS INDICATED.

**OVERHEAD MACHINERY SPACE NOTES:**
1. THE BUILDING CODE, MEETING WITH SEPTA, ELECTRICAL CONTRACTOR, GENERAL CONTRACTOR, CHIEF ENGINEER TO DISCUSS.
2. THE ELECTRICAL CODE (NEC). DISCONNECTS AND POWER FEEDS TO BE POSTED IN THE CONTROLLER ROOM.
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**ELECTRICAL NOTES:**
1. ALL WORK TO CONFORM TO THE FOLLOWING:
   - AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) Z100-2011 (ELEVATOR AND ESCALATOR MANUFACTURERS’ CODE OF PRACTICE),
   - AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) CODE, TITLE 34, PA CODE, 2009 EDITION.
   - NATIONAL ELECTRICAL CODE (NEC) 2008.
2. TO ENSURE PROPER EQUIPMENT OPERATION, THE OVERHEAD MACHINERY SPACE (INCLUDING FINISH PAINTING) ALL AREAS WHERE WALLS/FLOORS ARE REQUIRED.
3. ALL WORK TO CONFORM TO THE FOLLOWING:
   - AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) Z100-2011 (ELEVATOR AND ESCALATOR MANUFACTURERS’ CODE OF PRACTICE),
   - AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) CODE, TITLE 34, PA CODE, 2009 EDITION.
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